Started on	Tuesday, 24 November 2020, 3:50 PM
State	Finished
Completed on	Tuesday, 24 November 2020, 4:35 PM
Time taken	45 mins 13 secs
Grade	**30.00** out of 30.00 (**100**%)

Question **1**

Correct

Mark 1.00 out of 1.00

Let A be a 4×4-matrix such that $A\begin{bmatrix}1\\2\\3\\4\end{bmatrix} = \begin{bmatrix}0\\0\\0\\0\end{bmatrix}$, then

Select one:

- a. A is the zero matrix
- b. A is singular. ✔
- c. The system $Ax = 0$ has only one solution
- d. There are elementary matrices $E_1, E_2, \cdots, E_k$ such that $A = E_1 E_2 \cdots E_k$

The correct answer is: A is singular.

Question **2**

Correct

Mark 1.00 out of 1.00

Let A be a 3×4 matrix which has a row of zeros, and let B be a 4×4 matrix , then AB has a row of zeros.

Select one:

- a. True ✔
- b. False

The correct answer is: True

Question 3

Correct

Mark 1.00 out of 1.00

If A is an $n \times n$-symmetric matrix, then A^2 is symmetric.

Select one:

a. True ✔

b. False

The correct answer is: True

Question 4

Correct

Mark 1.00 out of 1.00

Let A be a 4×4 matrix. If the homogeneous system $Ax = 0$ has only the trivial solution then

Select one:

a. A is singular

b. A is nonsingular ✔

c. $\det(A) = 1$

d. $A = 0$

The correct answer is: A is nonsingular

Question 5

Correct

Mark 1.00 out of 1.00

If E is an elementary matrix of type III, then E^T is

Select one:

a. an elementary matrix of type I

b. an elementary matrix of type III ✔

c. not an elementary matrix

d. an elementary matrix of type II

The correct answer is: an elementary matrix of type III

Question **6**

Correct

Mark 1.00 out of 1.00

If A is a singular matrix, then A can be written as a product of elementary matrices.

Select one:

a. False ✔

b. True

The correct answer is: False

Question **7**

Correct

Mark 1.00 out of 1.00

If A, B, C are $n \times n$ nonsingular matrices, then $A^2 - B^2 = (A + B)(A - B)$.

Select one:

a. True

b. False ✔

The correct answer is: False

Question **8**

Correct

Mark 1.00 out of 1.00

If E is an elementary matrix then one of the following statements is not true

Select one:

a. E^{-1} is an elementary matrix.

b. E^T is an elementary matrix.

c. E is nonsingular.

d. $E + E^T$ is an elementary matrix. ✔

The correct answer is: $E + E^T$ is an elementary matrix.

Question **9**

Correct

Mark 1.00 out of 1.00

If x_0 is a solution of the nonhomogeneous system $Ax = b$ and x_1 is a solution of the homogeneous system $Ax = 0$. Then $x_1 + x_0$ is a solution of

Select one:

- a. the system $Ax = 2b$
- b. the system $Ax = 0$
- c. the system $Ax = b$ ✔
- d. the system $Ax = Ab$

The correct answer is: the system $Ax = b$

Question **10**

Correct

Mark 1.00 out of 1.00

If A, B are two square nonzero matrices and $AB = 0$ then both A and B are singular

Select one:

- a. False
- b. True ✔

The correct answer is: True

Question **11**

Correct

Mark 1.00 out of 1.00

If $(A|b) = \begin{pmatrix} 1 & 1 & 2 & | & 4 \\ 2 & -1 & 2 & | & 6 \\ 0 & 3 & 2 & | & 1 \end{pmatrix}$ is the augmented matrix of the system $Ax = b$ then the system has no solution

Select one:

- a. False
- b. True ✔

The correct answer is: True

Question **12**

Correct

Mark 1.00 out of 1.00

If A, B are $n \times n$-skew-symmetric matrices(A is skew symmetric if $A^T = -A$), then $AB + BA$ is symmetric

Select one:

- a. True ✔
- b. False

The correct answer is: True

Question **13**

Correct

Mark 1.00 out of 1.00

If the row echelon form of $(A|b)$ is $\begin{pmatrix} 1 & 0 & -2 & -1 & | & -2 \\ 0 & 1 & 1 & -1 & | & -1 \\ 0 & 0 & 1 & 1 & | & 0 \end{pmatrix}$ then the general form of the solutions is given by

Select one:

- a. $x = \begin{pmatrix} -2-\alpha \\ -1+2\alpha \\ -\alpha \\ \alpha \end{pmatrix}$ ✔
- b. $x = \begin{pmatrix} \alpha \\ 2-\alpha \\ \alpha \\ \alpha \end{pmatrix}$
- c. $x = \begin{pmatrix} -2-\alpha \\ 1-\alpha \\ \alpha \\ \alpha \end{pmatrix}$
- d. $x = \begin{pmatrix} -2-\alpha \\ 1-\alpha \\ \alpha \\ 1 \end{pmatrix}$

The correct answer is: $x = \begin{pmatrix} -2-\alpha \\ -1+2\alpha \\ -\alpha \\ \alpha \end{pmatrix}$

Question **14**

Correct

Mark 1.00 out of 1.00

If a matrix B is obtained from A by multiplying a row of A by a real number c, then $|A| = c|B|$.

Select one:

- a. False ✔
- b. True

The correct answer is: False

Question **15**

Correct

Mark 1.00 out of 1.00

If A is a nonsingular 3×3-matrix, then the reduced row echelon form of A has no row of zeros.

Select one:

- a. True ✔
- b. False

The correct answer is: True

Question **16**

Correct

Mark 1.00 out of 1.00

If A is a 4×3 matrix such that $Ax = 0$ has only the zero solution, and $b = \begin{pmatrix} 1 \\ 3 \\ 2 \\ 0 \end{pmatrix}$, then the system $Ax = b$

Select one:

- a. has exactly one solution
- b. is either inconsistent or has an infinite number of solutions
- c. is either inconsistent or has one solution ✔
- d. is inconsistent

The correct answer is: is either inconsistent or has one solution

Question **17**

Correct

Mark 1.00 out of 1.00

Let U be an $n \times n$-matrix in reduced row echelon form and $U \neq I$, then

Select one:

- a. $\det(U) = 1$
- b. U is the zero matrix
- c. The system $Ux = 0$ has only the zero solution.
- d. The system $Ux = 0$ has infinitely many solutions ✔

The correct answer is: The system $Ux = 0$ has infinitely many solutions

Question **18**

Correct

Mark 1.00 out of 1.00

If A is an $n \times n$ matrix and the system $Ax = b$ has infinitely many solutions, then

Select one:

- a. A is symmetric
- b. A has a row of zeros
- c. A singular ✔
- d. A is nonsingular

The correct answer is: A singular

Question **19**

Correct

Mark 1.00 out of 1.00

Let $A = \begin{pmatrix} 1 & -1 & 1 \\ 3 & -2 & 2 \\ -2 & 6 & 4 \end{pmatrix}$, then $\det(A) =$

Select one:

- a. 5
- b. 0
- c. 10 ✔
- d. 9

The correct answer is: 10

Question **20**

Correct

Mark 1.00 out of 1.00

The adjoint of the matrix $\begin{pmatrix} 2 & 5 \\ 1 & 3 \end{pmatrix}$ is

Select one:

- a. $\begin{pmatrix} -5 & 3 \\ 2 & -1 \end{pmatrix}$
- b. $\begin{pmatrix} -2 & 1 \\ 5 & -3 \end{pmatrix}$
- c. $\begin{pmatrix} 3 & -5 \\ -1 & 2 \end{pmatrix}$ ✔
- d. $\begin{pmatrix} -3 & 5 \\ 1 & -2 \end{pmatrix}$

The correct answer is: $\begin{pmatrix} 3 & -5 \\ -1 & 2 \end{pmatrix}$

Question **21**

Correct

Mark 1.00 out of 1.00

If A is a 3×3 matrix such that $det(A) = 2$, then $\det(3A) = 6$

Select one:

a. True

b. False ✔

The correct answer is: False

Question **22**

Correct

Mark 1.00 out of 1.00

In the linear system $Ax = b$, if $b = a_1 = a_2 + 3a_4$ then the system $Ax = b$ has infinite solutions.

Select one:

a. False

b. True ✔

The correct answer is: True

Question **23**

Correct

Mark 1.00 out of 1.00

If $AB = AC$, and $|A| \neq 0$, then

Select one:

a. $A = 0$

b. $B \neq C$

c. $A = C$

d. $B = C$.
✔

The correct answer is: $B = C$.

Question **24**

Correct

Mark 1.00 out of 1.00

If A is a nonsingular and symmetric matrix, then

Select one:

- a. A^{-1} is nonsingular and symmetric ✔
- b. A^{-1} is nonsingular and not symmetric
- c. A^{-1} is singular and symmetric
- d. A^{-1} is singular and not symmetric

The correct answer is: A^{-1} is nonsingular and symmetric

Question **25**

Correct

Mark 1.00 out of 1.00

If A is a 3×3 matrix with $\det(A) = 2$. Then $\det(adj(A)) =$

Select one:

- a. 4. ✔
- b. 2.
- c. -2.
- d. -4.

The correct answer is: 4.

Question **26**

Correct

Mark 1.00 out of 1.00

If $(A|b) = \begin{pmatrix} 1 & 2 & -1 & | & 0 \\ 2 & 3 & 1 & | & -1 \\ 1 & 1 & \alpha & | & \beta \end{pmatrix}$, then the system is inconsistent if

Select one:

- a. $\alpha \neq 2$ and β any number
- b. $\alpha = 2$ and $\beta = -1$
- c. $\alpha \neq 2$ and $\beta \neq -1$
- d. $\alpha = 2$ and $\beta \neq -1$ ✔

The correct answer is: $\alpha = 2$ and $\beta \neq -1$

Question **27**

Correct

Mark 1.00 out of 1.00

If $AB = 0$, where A and B are $n \times n$ nonzero matrices. Then

Select one:

- a. either $A = 0$ or $B = 0$
- b. either A or B is singular
- c. both A, B are nonsingular.
- d. both A, B are singular. ✔

The correct answer is: both A, B are singular.

Question **28**

Correct

Mark 1.00 out of 1.00

If y, z are solutions to $Ax = b$, then $\frac{1}{3}y + \frac{3}{4}z$ is a solution of the system $Ax = b$.

Select one:

- a. True
- b. False ✔

The correct answer is: False

Question **29**

Correct

Mark 1.00 out of 1.00

Let $A = \begin{pmatrix} 1 & 1 & 0 \\ 1 & a & 1 \\ 1 & 1 & 2 \end{pmatrix}$. the value(s) of a that make A nonsingular

Select one:

- a. $a \neq 1$ ✔
- b. $a = \frac{1}{2}$
- c. $a = 1$
- d. $a \neq \frac{1}{2}$

The correct answer is: $a \neq 1$

Question **30**

Correct

Mark 1.00 out of 1.00

Let $(1, 2, 0)^T$ and $(2, 1, 1)^T$ be the first two columns of a 3×3 matrix A and $(1, 1, 1)^T$ be a solution of the system $Ax = (2, 1, 3)^T$. Then the third column of the matrix A is

Select one:

- a. $(-1, -2, 2)^T$. ✔
- b. $(-1, -1, 2)^T$.
- c. $(1, 1, 0)^T$.
- d. $(4, -1, 1)^T$.

The correct answer is: $(-1, -2, 2)^T$.

◀ Announcements

Jump to...

Started on	Tuesday, 24 November 2020, 3:50 PM
State	Finished
Completed on	Tuesday, 24 November 2020, 4:53 PM
Time taken	1 hour 2 mins
Grade	**28.00** out of 30.00 (**93**%)

Question **1**
Correct
Mark 1.00 out of 1.00

An $n \times n$ matrix A is invertible if and only if

Select one:
- a. $|A| = 0$
- b. $Ax = 0$ has a nonzero solution
- c. $A = I$
- d. there exists a matrix B such that $AB = I$ ✔

The correct answer is: there exists a matrix B such that $AB = I$

Question **2**
Correct
Mark 1.00 out of 1.00

$(0, 0, 0)^T$ is a linear combination of the vectors $(1, 2, 3)^T, (1, 4, 1)^T, (2, 3, 1)^T$

Select one:
- a. True ✔
- b. False

The correct answer is: True

Question **3**
Correct
Mark 1.00 out of 1.00

In the $n \times n$-linear system $Ax = b$, if A is singular and b is a linear combination of the columns of A then the system has

Select one:
- a. exactly two solutions
- b. no solution
- c. a unique solution
- d. infinitely many solutions ✔

The correct answer is: infinitely many solutions

Question **4**
Correct
Mark 1.00 out of 1.00

If y, z are solutions to $Ax = b$, then $y + z$ is a solution of the system $Ax = 0$.

Select one:
- a. True
- b. False ✔

The correct answer is: False

Question **5**
Incorrect
Mark 0.00 out of 1.00

Any two $n \times n$-singular matrices are row equivalent.

Select one:
- a. False
- b. True ✖

The correct answer is: False

Question **6**
Correct
Mark 1.00 out of 1.00

If A is a 4×3-matrix, $b \in \mathbb{R}^4$, and the system $Ax = b$ is consistent, then $Ax = b$ has a unique solution.

Select one:
- a. True
- b. False ✔

The correct answer is: False

Question **7**
Correct
Mark 1.00 out of 1.00

If $(A|b) = \begin{pmatrix} 1 & 2 & -1 & | & 0 \\ 2 & 3 & 1 & | & -1 \\ 1 & 1 & \alpha & | & \beta \end{pmatrix}$, then the system has only one solution if

Select one:
- a. $\alpha \neq 2$ and β any number ✔
- b. $\alpha \neq 2$ and $\beta \neq -1$
- c. $\alpha = 2$ and $\beta = -1$
- d. $\alpha = 2$ and $\beta \neq -1$

The correct answer is: $\alpha \neq 2$ and β any number

Question **8**
Correct
Mark 1.00 out of 1.00

If A is a nonsingular 3×3-matrix, then the reduced row echelon form of A has no row of zeros.

Select one:
- a. False
- b. True ✔

The correct answer is: True

Question **9**
Correct
Mark 1.00 out of 1.00

If E is an elementary matrix then one of the following statements is not true

Select one:
- a. E^{-1} is an elementary matrix.
- b. E is nonsingular.
- c. E^T is an elementary matrix.
- d. $E + E^T$ is an elementary matrix. ✔

The correct answer is: $E + E^T$ is an elementary matrix.

Question **10**

Correct

Mark 1.00 out of 1.00

If A is a 3×3 matrix with $\det(A) = -2$. Then $\det(adj(A)) =$

Select one:

- a. 4. ✔
- b. -4.
- c. -8.
- d. 8.

The correct answer is: 4.

Question **11**

Correct

Mark 1.00 out of 1.00

If A is singular and B is nonsingular $n \times n$-matrices, then AB is

Select one:

- a. singular ✔
- b. may or may not be singular
- c. nonsingular

The correct answer is: singular

Question **12**

Correct

Mark 1.00 out of 1.00

If $(A|b) = \begin{pmatrix} 1 & 1 & 2 & | & 4 \\ 2 & -1 & 2 & | & 6 \\ 1 & 1 & 2 & | & 5 \end{pmatrix}$, then the system $Ax = b$ is inconsistent

Select one:

- a. True ✔
- b. False

The correct answer is: True

Question **13**

Correct

Mark 1.00 out of 1.00

If A is a singular $n \times n$-matrix, $b \in \mathbb{R}^n$, then the system $Ax = b$

Select one:

- a. has either no solution or an infinite number of solutions ✔
- b. has infinitely many solutions.
- c. has a unique solution
- d. is inconsistent

The correct answer is: has either no solution or an infinite number of solutions

Question **14**

Correct

Mark 1.00 out of 1.00

If A is symmetric and skew symmetric then $A = 0$. (A is skew symmetric if $A = -A^T$).

Select one:

- a. True ✔
- b. False

The correct answer is: True

Question **15**
Correct
Mark 1.00 out of 1.00

If $A = LU$ is the LU-factorization of a matrix A, and A is singular, then

Select one:
- a. L and U are both singular
- b. U is singular and L is nonsigular ✔
- c. L and U are both nonsingular
- d. L is singular and U is nonsigular

The correct answer is: U is singular and L is nonsigular

Question **16**
Correct
Mark 1.00 out of 1.00

If A and B are singular matrices, then $A + B$ is also singular.

Select one:
- a. False ✔
- b. True

The correct answer is: False

Question **17**
Correct
Mark 1.00 out of 1.00

If A is a singular matrix, then A can be written as a product of elementary matrices.

Select one:
- a. False ✔
- b. True

The correct answer is: False

Question **18**
Correct
Mark 1.00 out of 1.00

Let $(1, 2, 0)^T$ and $(2, 1, 1)^T$ be the first two columns of a 3×3 matrix A and $(1, 1, 1)^T$ be a solution of the system $Ax = (4, 4, 5)^T$. Then the third column of the matrix A is

Select one:
- a. $(1, 1, 4)^T$. ✔
- b. $(4, -1, 1)^T$.
- c. $(-1, -1, -4)^T$.
- d. $(-1, -2, 1)^T$.

The correct answer is: $(1, 1, 4)^T$.

Question **19**
Correct
Mark 1.00 out of 1.00

Let A be a 3×4 matrix which has a row of zeros, and let B be a 4×4 matrix , then AB has a row of zeros.

Select one:
- a. True ✔
- b. False

The correct answer is: True

Question **20**

Correct

Mark 1.00 out of 1.00

Let A be a 4×4-matrix such that $A \begin{bmatrix} 1 \\ 2 \\ 3 \\ 4 \end{bmatrix} = \begin{bmatrix} 0 \\ 0 \\ 0 \\ 0 \end{bmatrix}$, then

Select one:

- a. There are elementary matrices $E_1, E_2, \cdots, E_k$ such that $A = E_1 E_2 \cdots E_k$
- b. A is the zero matrix
- c. The system $Ax = 0$ has only one solution
- d. A is singular. ✔

The correct answer is: A is singular.

Question **21**

Correct

Mark 1.00 out of 1.00

If E is an elementary matrix of type III, then E^T is

Select one:

- a. an elementary matrix of type I
- b. an elementary matrix of type II
- c. not an elementary matrix
- d. an elementary matrix of type III ✔

The correct answer is: an elementary matrix of type III

Question **22**

Correct

Mark 1.00 out of 1.00

Let $A = \begin{pmatrix} 1 & -1 & 1 \\ 3 & -2 & 2 \\ -2 & -1 & 3 \end{pmatrix}$, then $\det(A) =$

Select one:

- a. 2 ✔
- b. 3
- c. 5
- d. 0

The correct answer is: 2

Question **23**

Correct

Mark 1.00 out of 1.00

If the row echelon form of $(A|b)$ is $\begin{pmatrix} 1 & 0 & -2 & -1 & | & -2 \\ 0 & 1 & 1 & -1 & | & -1 \\ 0 & 0 & 1 & 1 & | & 0 \end{pmatrix}$ then the general form of the solutions is given by

Select one:

- a. $x = \begin{pmatrix} -2-\alpha \\ 1-\alpha \\ \alpha \\ \alpha \end{pmatrix}$
- b. $x = \begin{pmatrix} -2-\alpha \\ 1-\alpha \\ \alpha \\ 1 \end{pmatrix}$
- c. $x = \begin{pmatrix} -2-\alpha \\ -1+2\alpha \\ -\alpha \\ \alpha \end{pmatrix}$ ✔
- d. $x = \begin{pmatrix} \alpha \\ 2-\alpha \\ \alpha \\ \alpha \end{pmatrix}$

The correct answer is: $x = \begin{pmatrix} -2-\alpha \\ -1+2\alpha \\ -\alpha \\ \alpha \end{pmatrix}$

Question **24**

Correct

Mark 1.00 out of 1.00

If A, B are $n \times n$-skew-symmetric matrices(A is skew symmetric if $A^T = -A$), then $AB + BA$ is symmetric

Select one:

- a. True ✔
- b. False

The correct answer is: True

Question **25**

Correct

Mark 1.00 out of 1.00

Let A be a 4×3-matrix with $a_2 - a_3 = 0$. If $b = a_1 + a_2 + a_3$, where a_j is the jth column of A, then the system $Ax = b$ will have infinitely many solutions.

Select one:

- a. False
- b. True ✔

The correct answer is: True

Question **26**

Correct

Mark 1.00 out of 1.00

If A is a 3×3-matrix and the system $Ax = \begin{pmatrix} 5 \\ 1 \\ 3 \end{pmatrix}$ has a unique solution, then the system $Ax = \begin{pmatrix} 0 \\ 0 \\ 0 \end{pmatrix}$

Select one:

- a. is inconsistent
- b. has only the zero solution. ✔
- c. has infinitely many solutions

The correct answer is: has only the zero solution.

Question **27**

Incorrect

Mark 0.00 out of 1.00

If $AB = 0$, where A and B are $n \times n$ nonzero matrices. Then

Select one:

- a. either A or B is singular ✖
- b. both A, B are singular.
- c. both A, B are nonsingular.
- d. either $A = 0$ or $B = 0$

The correct answer is: both A, B are singular.

Question **28**

Correct

Mark 1.00 out of 1.00

If x_0 is a solution of the nonhomogeneous system $Ax = b$ and x_1 is a solution of the homogeneous system $Ax = 0$. Then $x_1 + x_0$ is a solution of

Select one:

- a. the system $Ax = 0$
- b. the system $Ax = 2b$
- c. the system $Ax = Ab$
- d. the system $Ax = b$ ✔

The correct answer is: the system $Ax = b$

Question **29**

Correct

Mark 1.00 out of 1.00

If A is a nonsingular $n \times n$ matrix, $b \in \mathbb{R}^n$, then

Select one:

- a. The system $Ax = b$ is inconsistent
- b. The system $Ax = b$ has only two solutions
- c. The system $Ax = b$ has a unique solution ✔
- d. The system $Ax = b$ has infinitely many solutions

The correct answer is: The system $Ax = b$ has a unique solution

Question **30**

Correct

Mark 1.00 out of 1.00

The adjoint of the matrix $\begin{pmatrix} -1 & 2 \\ 1 & 3 \end{pmatrix}$ is

Select one:

a. $\begin{pmatrix} -1 & 1 \\ 2 & -3 \end{pmatrix}$

b. $\begin{pmatrix} 1 & -2 \\ -1 & -3 \end{pmatrix}$

c. $\begin{pmatrix} 3 & -2 \\ -1 & -1 \end{pmatrix}$ ✔

d. $\begin{pmatrix} 1 & 1 \\ 2 & 3 \end{pmatrix}$

The correct answer is: $\begin{pmatrix} 3 & -2 \\ -1 & -1 \end{pmatrix}$

← Announcements

Jump to...

Started on	Tuesday, 24 November 2020, 3:51 PM
State	Finished
Completed on	Tuesday, 24 November 2020, 4:48 PM
Time taken	57 mins 9 secs
Grade	**28.00** out of 30.00 (**93**%)

Question **1**

Correct

Mark 1.00 out of 1.00

Let $A = \begin{pmatrix} 1 & -1 & 1 \\ 3 & -2 & 2 \\ -2 & 4 & 3 \end{pmatrix}$, then $\det(A) =$

Select one:

a. 0

b. 9

c. 5

d. 7 ✔

The correct answer is: 7

Question **2**

Correct

Mark 1.00 out of 1.00

If A is a 2×3-matrix, and $b = a_2$ (second column of A), then a solution to the system $Ax = b$ is

Select one:

a. $x = \begin{pmatrix} 1 \\ 0 \\ 0 \\ 0 \end{pmatrix}$

b. $x = \begin{pmatrix} 1 \\ 0 \\ 0 \end{pmatrix}$

c. $x = \begin{pmatrix} 0 \\ 1 \\ 0 \\ 0 \end{pmatrix}$

d. $x = \begin{pmatrix} 0 \\ 1 \\ 0 \end{pmatrix}$ ✔

The correct answer is: $x = \begin{pmatrix} 0 \\ 1 \\ 0 \end{pmatrix}$

Question **3**

Correct

Mark 1.00 out of 1.00

If A is a 2×2 matrix with $\det(A) = -2$. Then $\det(adj(A)) =$

Select one:

- a. 2.
- b. -2. ✔
- c. -4.
- d. 4.

The correct answer is: -2.

Question **4**

Correct

Mark 1.00 out of 1.00

If A, B, C are $n \times n$ nonsingular matrices, then $A^2 - B^2 = (A+B)(A-B)$.

Select one:

- a. False ✔
- b. True

The correct answer is: False

Question **5**

Correct

Mark 1.00 out of 1.00

If A is a singular matrix, then A can be written as a product of elementary matrices.

Select one:

- a. False ✔
- b. True

The correct answer is: False

Question **6**

Correct

Mark 1.00 out of 1.00

The adjoint of the matrix $\begin{pmatrix} 5 & 2 \\ -1 & 6 \end{pmatrix}$ is

Select one:

- a. $\begin{pmatrix} 5 & -1 \\ 2 & 6 \end{pmatrix}$
- b. $\begin{pmatrix} 6 & -2 \\ 1 & 5 \end{pmatrix}$ ✔
- c. $\begin{pmatrix} -5 & -1 \\ 2 & -6 \end{pmatrix}$
- d. $\begin{pmatrix} -6 & 2 \\ -1 & -5 \end{pmatrix}$

The correct answer is: $\begin{pmatrix} 6 & -2 \\ 1 & 5 \end{pmatrix}$

Question **7**

Correct

Mark 1.00 out of 1.00

If A and B are $n \times n$ matrices such that $Ax \neq Bx$ for all nonzero $x \in \mathbb{R}^n$. Then

Select one:

- a. A and B are singular.
- b. $A - B$ is singular.
- c. A and B are nonsingular.
- d. $A - B$ is nonsingular. ✔

The correct answer is: $A - B$ is nonsingular.

Question **8**

Incorrect

Mark 0.00 out of 1.00

If y, z are solutions to $Ax = b$, then $\frac{1}{3}y + \frac{3}{4}z$ is a solution of the system $Ax = b$.

Select one:

- a. False
- b. True ✖

The correct answer is: False

Question **9**

Correct

Mark 1.00 out of 1.00

Let A be a 4×4-matrix such that $A \begin{bmatrix} 1 \\ 2 \\ 3 \\ 4 \end{bmatrix} = \begin{bmatrix} 0 \\ 0 \\ 0 \\ 0 \end{bmatrix}$, then

Select one:

- a. There are elementary matrices $E_1, E_2, \cdots, E_k$ such that $A = E_1 E_2 \cdots E_k$
- b. The system $Ax = 0$ has only one solution
- c. A is singular. ✔
- d. A is the zero matrix

The correct answer is: A is singular.

Question **10**

Correct

Mark 1.00 out of 1.00

If A is symmetric and skew symmetric then $A = 0$. (A is skew symmetric if $A = -A^T$).

Select one:

- a. False
- b. True ✔

The correct answer is: True

Question **11**

Correct

Mark 1.00 out of 1.00

An $n \times n$ matrix A is invertible if and only if

Select one:

- a. there exists a matrix B such that $AB = I$ ✔
- b. $A = I$
- c. $|A| = 0$
- d. $Ax = 0$ has a nonzero solution

The correct answer is: there exists a matrix B such that $AB = I$

Question **12**

Correct

Mark 1.00 out of 1.00

If A, B, C are $n \times n$-matrices with A nonsigular and $AB = AC$, then $B = C$

Select one:

- a. False
- b. True ✔

The correct answer is: True

Question **13**

Correct

Mark 1.00 out of 1.00

In the square linear system $Ax = b$, if A is singular and b is not a linear combination of the columns of A then the system

Select one:

- a. has a unique solution
- b. has infinitely many solutions
- c. can not tell
- d. has no solution ✔

The correct answer is: has no solution

Question **14**

Correct

Mark 1.00 out of 1.00

Any two $n \times n$-singular matrices are row equivalent.

Select one:

- a. False ✔
- b. True

The correct answer is: False

Question **15**

Correct

Mark 1.00 out of 1.00

If A is a singular $n \times n$-matrix, $b \in \mathbb{R}^n$, then the system $Ax = b$

Select one:

- a. is inconsistent
- b. has a unique solution
- c. has either no solution or an infinite number of solutions ✔
- d. has infinitely many solutions.

The correct answer is: has either no solution or an infinite number of solutions

Question **16**
Correct
Mark 1.00 out of 1.00

Let A be a 3×4 matrix which has a row of zeros, and let B be a 4×4 matrix , then AB has a row of zeros.

Select one:
- a. True ✔
- b. False

The correct answer is: True

Question **17**
Correct
Mark 1.00 out of 1.00

If E is an elementary matrix of type III, then E^T is

Select one:
- a. an elementary matrix of type II
- b. an elementary matrix of type I
- c. an elementary matrix of type III ✔
- d. not an elementary matrix

The correct answer is: an elementary matrix of type III

Question **18**
Correct
Mark 1.00 out of 1.00

If the row echelon form of $(A|b)$ is $\begin{pmatrix} 1 & 0 & -2 & -1 & | & -2 \\ 0 & 1 & 1 & -1 & | & -1 \\ 0 & 0 & 1 & 1 & | & 0 \end{pmatrix}$ then the general form of the solutions is given by

Select one:
- a. $x = \begin{pmatrix} -2-\alpha \\ 1-\alpha \\ \alpha \\ \alpha \end{pmatrix}$
- b. $x = \begin{pmatrix} -2-\alpha \\ 1-\alpha \\ \alpha \\ 1 \end{pmatrix}$
- c. $x = \begin{pmatrix} -2-\alpha \\ -1+2\alpha \\ -\alpha \\ \alpha \end{pmatrix}$ ✔
- d. $x = \begin{pmatrix} \alpha \\ 2-\alpha \\ \alpha \\ \alpha \end{pmatrix}$

The correct answer is: $x = \begin{pmatrix} -2-\alpha \\ -1+2\alpha \\ -\alpha \\ \alpha \end{pmatrix}$

Question **19**

Incorrect

Mark 0.00 out of 1.00

If $(A|b) = \begin{pmatrix} 1 & 1 & 2 & | & 4 \\ 2 & -1 & 2 & | & 6 \\ 0 & 3 & 2 & | & 1 \end{pmatrix}$ is the augmented matrix of the system $Ax = b$ then the system has no solution

Select one:

- a. False ✖
- b. True

The correct answer is: True

Question **20**

Correct

Mark 1.00 out of 1.00

If $(A|b) = \begin{pmatrix} 1 & 2 & -1 & | & 0 \\ 2 & 3 & 1 & | & -1 \\ 1 & 1 & \alpha & | & \beta \end{pmatrix}$, then the system is inconsistent if

Select one:

- a. $\alpha \neq 2$ and $\beta \neq -1$
- b. $\alpha \neq 2$ and β any number
- c. $\alpha = 2$ and $\beta = -1$
- d. $\alpha = 2$ and $\beta \neq -1$ ✔

The correct answer is: $\alpha = 2$ and $\beta \neq -1$

Question **21**

Correct

Mark 1.00 out of 1.00

Let $(1, 2, 0)^T$ and $(2, 1, 1)^T$ be the first two columns of a 3×3 matrix A and $(1, 1, 1)^T$ be a solution of the system $Ax = (5, 2, 4)^T$. Then the third column of the matrix A is

Select one:

- a. $(-2, 1, -3)^T$.
- b. $(1, -1, -4)^T$.
- c. $(2, -1, 3)^T$. ✔
- d. $(1, -1, 4)^T$.

The correct answer is: $(2, -1, 3)^T$.

Question **22**

Correct

Mark 1.00 out of 1.00

If A is a nonsingular $n \times n$ matrix, then

Select one:

- a. There are elementary matrices $E_1, E_2, \cdots, E_k$ such that $A = E_1 E_2 \cdots E_k$. ✔
- b. $\det(A) = 1$
- c. There is a singular matrix C such that $A = CI$.
- d. The system $Ax = 0$ has a nontrivial (nonzero) solution.

The correct answer is: There are elementary matrices $E_1, E_2, \cdots, E_k$ such that $A = E_1 E_2 \cdots E_k$.

Question **23**

Correct

Mark 1.00 out of 1.00

If A is a symmetric $n \times n$-matrix and P any $n \times n$-matrix, then PAP^T is

Select one:

- a. symmetric ✔
- b. not defined
- c. singular
- d. not symmetric

The correct answer is: symmetric

Question **24**

Correct

Mark 1.00 out of 1.00

If A is an $n \times n$ matrix and the system $Ax = b$ has infinitely many solutions, then

Select one:

- a. A is symmetric
- b. A has a row of zeros
- c. A singular ✔
- d. A is nonsingular

The correct answer is: A singular

Question **25**

Correct

Mark 1.00 out of 1.00

If A is a 3×3 matrix such that $det(A) = 2$, then $\det(3A) = 6$

Select one:

- a. False ✔
- b. True

The correct answer is: False

Question **26**

Correct

Mark 1.00 out of 1.00

If A, B, C are 3×3-matrices, $\det(A) = 9, \det(B) = 2, \det(C) = 3$, then $\det(3C^T BA^{-1}) =$

Select one:

- a. 6
- b. 18 ✔
- c. 16
- d. 2

The correct answer is: 18

Question **27**

Correct

Mark 1.00 out of 1.00

If A and B are singular matrices, then $A + B$ is also singular.

Select one:

- a. False ✔
- b. True

The correct answer is: False

Question **28**

Correct

Mark 1.00 out of 1.00

In the $n \times n$-linear system $Ax = b$, if A is singular and b is a linear combination of the columns of A then the system has

Select one:

- a. no solution
- b. a unique solution
- c. infinitely many solutions ✔
- d. exactly two solutions

The correct answer is: infinitely many solutions

Question **29**

Correct

Mark 1.00 out of 1.00

If A is a 4×3-matrix, $b \in \mathbb{R}^4$, and the system $Ax = b$ is consistent, then $Ax = b$ has a unique solution.

Select one:

- a. False ✔
- b. True

The correct answer is: False

Da
Sv

Question **30**

Correct

Mark 1.00 out of 1.00

If A is a 3×3-matrix and the system $Ax = \begin{pmatrix} 5 \\ 1 \\ 3 \end{pmatrix}$ has a unique solution, then the system $Ax = \begin{pmatrix} 0 \\ 0 \\ 0 \end{pmatrix}$

Select one:

- a. has infinitely many solutions
- b. has only the zero solution. ✔
- c. is inconsistent

The correct answer is: has only the zero solution.

← Announcements

Jump to...

Question **1**

Incorrect

Mark 0.00 out of 1.00

If A is a 4×3-matrix, $b \in \mathbb{R}^4$, and the system $Ax = b$ is consistent, then $Ax = b$ has a unique solution.

Select one:

- a. False
- b. True ✖

The correct answer is: False

Question **2**

Incorrect

Mark 0.00 out of 1.00

If A is a singular matrix, then the system $Ax = b$ has infinite number of solutions

Select one:

- a. True ✖
- b. False

The correct answer is: False

α

Question **4**

Correct

Mark 1.00 out of 1.00

If $(A|b) = \begin{pmatrix} 1 & 2 & -1 & | & 0 \\ 2 & 3 & 1 & | & -1 \\ 1 & 1 & \alpha & | & \beta \end{pmatrix}$, then the system has infinite number of solutions if

Select one:

- a. $\alpha \neq 2$ and β any number
- b. $\alpha = 2$ and $\beta \neq -1$
- c. $\alpha = 2$ and $\beta = -1$ ✔
- d. $\alpha \neq 2$ and $\beta \neq -1$

The correct answer is: $\alpha = 2$ and $\beta = -1$

Question **5**

Correct

Mark 1.00 out of 1.00

Let $A = \begin{pmatrix} 1 & -1 & 1 \\ 3 & -2 & 2 \\ -2 & 1 & 3 \end{pmatrix}$, then $\det(A) =$

Select one:

- a. 4 ✔
- b. 0
- c. 8
- d. 1

The correct answer is: 4

Question **6**

Correct

Mark 1.00 out of 1.00

If $(A|b) = \begin{pmatrix} 1 & 1 & 2 & | & 4 \\ 2 & -1 & 2 & | & 6 \\ 1 & 1 & 2 & | & 5 \end{pmatrix}$, then the system $Ax = b$ is inconsistent

Select one:

- a. False
- b. True ✔

The correct answer is: True

Question **7**

Incorrect

Mark 0.00 out of 1.00

If a matrix B is obtained from A by multiplying a row of A by a real number c, then $|A| = c|B|$.

Select one:

- a. False
- b. True ✖

The correct answer is: False

Question **8**

Incorrect

Mark 0.00 out of 1.00

In the square linear system $Ax = b$, if A is singular and b is not a linear combination of the columns of A then the system

Select one:

- a. can not tell
- b. has a unique solution
- c. has infinitely many solutions ✖
- d. has no solution

The correct answer is: has no solution

Question **9**

Correct

Mark 1.00 out of 1.00

If E is an elementary matrix of type III, then E^T is

Select one:

- a. not an elementary matrix
- b. an elementary matrix of type III ✔
- c. an elementary matrix of type I
- d. an elementary matrix of type II

The correct answer is: an elementary matrix of type III

Question **10**

Correct

Mark 1.00 out of 1.00

If $AB = 0$, where A and B are $n \times n$ nonzero matrices. Then

Select one:

- a. both A, B are nonsingular.
- b. both A, B are singular. ✔
- c. either A or B is singular
- d. either $A = 0$ or $B = 0$

The correct answer is: both A, B are singular.

Question **11**

Correct

Mark 1.00 out of 1.00

If A, B are $n \times n$-skew-symmetric matrices(A is skew symmetric if $A^T = -A$), then $AB + BA$ is symmetric

Select one:

- a. False
- b. True ✔

The correct answer is: True

Question **12**

Correct

Mark 1.00 out of 1.00

If A is a 3×3 matrix such that $det(A) = 2$, then $\det(3A) = 6$

Select one:

- a. True
- b. False ✔

The correct answer is: False

Question **13**

Correct

Mark 1.00 out of 1.00

The adjoint of the matrix $\begin{pmatrix} 2 & 5 \\ 1 & 3 \end{pmatrix}$ is

Select one:

a. $\begin{pmatrix} -5 & 3 \\ 2 & -1 \end{pmatrix}$

b. $\begin{pmatrix} -3 & 5 \\ 1 & -2 \end{pmatrix}$

c. $\begin{pmatrix} 3 & -5 \\ -1 & 2 \end{pmatrix}$ ✔

d. $\begin{pmatrix} -2 & 1 \\ 5 & -3 \end{pmatrix}$

The correct answer is: $\begin{pmatrix} 3 & -5 \\ -1 & 2 \end{pmatrix}$

Question **14**

Correct

Mark 1.00 out of 1.00

Let $(1,2,0)^T$ and $(2,1,1)^T$ be the first two columns of a 3×3 matrix A and $(1,1,1)^T$ be a solution of the system $Ax = (2,1,3)^T$. Then the third column of the matrix A is

Select one:

a. $(1,1,0)^T$.

b. $(-1,-2,2)^T$. ✔

c. $(4,-1,1)^T$.

d. $(-1,-1,2)^T$.

The correct answer is: $(-1,-2,2)^T$.

Question **15**

Correct

Mark 1.00 out of 1.00

$(0,0,0)^T$ is a linear combination of the vectors $(1,2,3)^T, (1,4,1)^T, (2,3,1)^T$

Select one:

a. True ✔

b. False

The correct answer is: True

Question **16**

Correct

Mark 1.00 out of 1.00

Let A be a 4×4-matrix such that $A \begin{bmatrix} 1 \\ 2 \\ 3 \\ 4 \end{bmatrix} = \begin{bmatrix} 0 \\ 0 \\ 0 \\ 0 \end{bmatrix}$, then

Select one:

a. There are elementary matrices $E_1, E_2, \cdots, E_k$ such that $A = E_1 E_2 \cdots E_k$

b. A is singular. ✔

c. A is the zero matrix

d. The system $Ax = 0$ has only one solution

The correct answer is: A is singular.

Question **17**

Incorrect

Mark 0.00 out of 1.00

Let A be a 3×4 matrix which has a row of zeros, and let B be a 4×4 matrix , then AB has a row of zeros.

Select one:

a. False

b. True

The correct answer is: True

Question **18**

Incorrect

Mark 0.00 out of 1.00

If A is a 4×3 matrix such that $Ax = 0$ has only the zero solution, and $b = \begin{pmatrix} 1 \\ 3 \\ 2 \\ 0 \end{pmatrix}$, then the system $Ax = b$

Select one:

a. is either inconsistent or has an infinite number of solutions

b. is inconsistent

c. is either inconsistent or has one solution

d. has exactly one solution

The correct answer is: is either inconsistent or has one solution

Question **19**

Correct

Mark 1.00 out of 1.00

If x_0 is a solution of the nonhomogeneous system $Ax = b$ and x_1 is a solution of the homogeneous system $Ax = 0$. Then $x_1 + x_0$ is a solution of

Select one:

a. the system $Ax = 0$

b. the system $Ax = 2b$

c. the system $Ax = Ab$

d. the system $Ax = b$

The correct answer is: the system $Ax = b$

Question **20**

Correct

Mark 1.00 out of 1.00

If A, B are two square nonzero matrices and $AB = 0$ then both A and B are singular

Select one:

a. False

b. True

The correct answer is: True

Question **21**

Incorrect

Mark 0.00 out of 1.00

If A is a 3×3 matrix with $\det(A) = -1$. Then $\det(adj(A)) =$

Select one:

a. -1.

b. 3.

c. -3.

d. 1.

The correct answer is: 1.

Question **22**

Correct

Mark 1.00 out of 1.00

If A is a 3×5 matrix, then the system $Ax = 0$

Select one:

a. has no solution.

b. has only the zero solution

c. has infinitely many solutions

d. is inconsistent

The correct answer is: has infinitely many solutions

Question **23**

Correct

Mark 1.00 out of 1.00

If A is a nonsingular $n \times n$ matrix, $b \in \mathbb{R}^n$, then

Select one:

a. The system $Ax = b$ is inconsistent

b. The system $Ax = b$ has infinitely many solutions

c. The system $Ax = b$ has only two solutions

d. The system $Ax = b$ has a unique solution

The correct answer is: The system $Ax = b$ has a unique solution

Question **24**

Correct

Mark 1.00 out of 1.00

If A, B are $n \times n$ symmetric matrices then AB is symmetric.

Select one:

a. False

b. True

The correct answer is: False

Question **25**

Correct

Mark 1.00 out of 1.00

If A is a 2×3-matrix, and $b = a_2$ (second column of A), then a solution to the system $Ax = b$ is

Select one:

a. $x = \begin{pmatrix} 1 \\ 0 \\ 0 \\ 0 \end{pmatrix}$

b. $x = \begin{pmatrix} 1 \\ 0 \\ 0 \end{pmatrix}$

c. $x = \begin{pmatrix} 0 \\ 1 \\ 0 \end{pmatrix}$ ✔

d. $x = \begin{pmatrix} 0 \\ 1 \\ 0 \\ 0 \end{pmatrix}$

The correct answer is: $x = \begin{pmatrix} 0 \\ 1 \\ 0 \end{pmatrix}$

Question **26**

Incorrect

Mark 0.00 out of 1.00

If A and B are $n \times n$ matrices such that $Ax \neq Bx$ for all nonzero $x \in \mathbb{R}^n$. Then

Select one:

a. $A - B$ is nonsingular.

b. A and B are nonsingular. ✖

c. $A - B$ is singular.

d. A and B are singular.

The correct answer is: $A - B$ is nonsingular.

Question **27**

Correct

Mark 1.00 out of 1.00

If A is a nonsingular $n \times n$ matrix, then

Select one:

a. There are elementary matrices $E_1, E_2, \cdots, E_k$ such that $A = E_1 E_2 \cdots E_k$. ✔

b. There is a singular matrix C such that $A = CI$.

c. The system $Ax = 0$ has a nontrivial (nonzero) solution.

d. $\det(A) = 1$

The correct answer is: There are elementary matrices $E_1, E_2, \cdots, E_k$ such that $A = E_1 E_2 \cdots E_k$.

Question 28

Correct

Mark 1.00 out of 1.00

Any elementary matrix is nonsingular

Select one:

a. False

b. True

The correct answer is: True

Question 29

Correct

Mark 1.00 out of 1.00

If A is singular and B is nonsingular $n \times n$-matrices, then AB is

Select one:

a. singular

b. may or may not be singular

c. nonsingular

The correct answer is: singular

Question 30

Correct

Mark 1.00 out of 1.00

In the $n \times n$-linear system $Ax = b$, if A is singular and b is a linear combination of the columns of A then the system has

Select one:

a. exactly two solutions

b. no solution

c. a unique solution

d. infinitely many solutions

The correct answer is: infinitely many solutions

← Announcements

Jump to...

Started on	Tuesday, 24 November 2020, 4:00 PM
State	Finished
Completed on	Tuesday, 24 November 2020, 5:07 PM
Time taken	1 hour 7 mins
Grade	**24.00** out of 30.00 (**80**%)

Question **1**
Correct
Mark 1.00 out of 1.00

If A, B, C are 3×3-matrices, $\det(A) = 9, \det(B) = 2, \det(C) = 3$, then $\det(3C^T BA^{-1}) =$

Select one:
- a. 6
- b. 16
- c. 18 ✔
- d. 2

The correct answer is: 18

Question **2**
Correct
Mark 1.00 out of 1.00

Let $A = \begin{pmatrix} 1 & -1 & 1 \\ 3 & -2 & 2 \\ -2 & -2 & 3 \end{pmatrix}$, then $\det(A) =$

Select one:
- a. 1 ✔
- b. 9
- c. 7
- d. 0

The correct answer is: 1

Question **3**
Correct
Mark 1.00 out of 1.00

The adjoint of the matrix $\begin{pmatrix} 4 & 1 \\ 2 & -1 \end{pmatrix}$ is

Select one:
- a. $\begin{pmatrix} -1 & -1 \\ -2 & 4 \end{pmatrix}$ ✔
- b. $\begin{pmatrix} -1 & -2 \\ -3 & -5 \end{pmatrix}$
- c. $\begin{pmatrix} 4 & -1 \\ -2 & -1 \end{pmatrix}$
- d. $\begin{pmatrix} -1 & 2 \\ 1 & -4 \end{pmatrix}$

The correct answer is: $\begin{pmatrix} -1 & -1 \\ -2 & 4 \end{pmatrix}$

Question **4**

Correct

Mark 1.00 out of 1.00

If $A = \begin{pmatrix} 1 & 4 & -1 \\ 2 & 9 & 2 \\ -3 & -12 & 3 \end{pmatrix}$ then the lower triangular matrix L in the LU-facrorization of A is given by

Select one:

a. $L = \begin{pmatrix} 1 & 0 & 0 \\ 2 & 1 & 0 \\ -3 & 0 & 1 \end{pmatrix}$ ✔

b. $L = \begin{pmatrix} 1 & 0 & 0 \\ 2 & 1 & 0 \\ -3 & 0 & 0 \end{pmatrix}$

c. $L = \begin{pmatrix} 1 & 0 & 0 \\ -2 & 1 & 0 \\ 3 & 0 & 1 \end{pmatrix}$

d. $L = \begin{pmatrix} 1 & 0 & 0 \\ -2 & 1 & 0 \\ 3 & 0 & 0 \end{pmatrix}$

The correct answer is: $L = \begin{pmatrix} 1 & 0 & 0 \\ 2 & 1 & 0 \\ -3 & 0 & 1 \end{pmatrix}$

Question **5**

Correct

Mark 1.00 out of 1.00

Any two $n \times n$-singular matrices are row equivalent.

Select one:

a. True

b. False ✔

The correct answer is: False

Question **6**

Correct

Mark 1.00 out of 1.00

If A is a nonsingular and symmetric matrix, then

Select one:

a. A^{-1} is singular and symmetric

b. A^{-1} is singular and not symmetric

c. A^{-1} is nonsingular and symmetric ✔

d. A^{-1} is nonsingular and not symmetric

The correct answer is: A^{-1} is nonsingular and symmetric

Question **7**

Correct

Mark 1.00 out of 1.00

If $AB = AC$, and $|A| \neq 0$, then

Select one:

a. $B \neq C$

b. $A = 0$

c. $A = C$

d. $B = C$.

The correct answer is: $B = C$.

Question **8**

Incorrect

Mark 0.00 out of 1.00

If A, B are $n \times n$ symmetric matrices then AB is symmetric.

Select one:

a. False

b. True

The correct answer is: False

Question **9**

Correct

Mark 1.00 out of 1.00

If y, z are solutions to $Ax = b$, then $y + z$ is a solution of the system $Ax = 0$.

Select one:

a. False

b. True

The correct answer is: False

Question **10**

Correct

Mark 1.00 out of 1.00

Let $A = \begin{pmatrix} 1 & 1 & 0 \\ 1 & a & 1 \\ 1 & 1 & 2 \end{pmatrix}$. the value(s) of a that make A nonsingular

Select one:

a. $a \neq \frac{1}{2}$

b. $a = 1$

c. $a = \frac{1}{2}$

d. $a \neq 1$

The correct answer is: $a \neq 1$

Question **11**

Incorrect

Mark 0.00 out of 1.00

If A, B are $n \times n$-skew-symmetric matrices(A is skew symmetric if $A^T = -A$), then $AB + BA$ is symmetric

Select one:

a. True

b. False

The correct answer is: True

Question 12

Correct

Mark 1.00 out of 1.00

If A is a singular matrix, then A^T is also singular.

Select one:

- a. True ✔
- b. False

The correct answer is: True

Question 13

Correct

Mark 1.00 out of 1.00

If A is a 4×3-matrix, $b \in \mathbb{R}^4$, and the system $Ax = b$ is consistent, then $Ax = b$ has a unique solution.

Select one:

- a. True
- b. False ✔

The correct answer is: False

Question 14

Correct

Mark 1.00 out of 1.00

If A is a 4×4-matrix and $x = \begin{pmatrix} 2 \\ 3 \\ 0 \\ 1 \end{pmatrix}$ is a solution to the system $Ax = 0$, then A is singular.

Select one:

- a. False
- b. True ✔

The correct answer is: True

Question 15

Correct

Mark 1.00 out of 1.00

If A and B are $n \times n$ matrices such that $Ax \neq Bx$ for all nonzero $x \in \mathbb{R}^n$. Then

Select one:

- a. $A - B$ is singular.
- b. A and B are nonsingular.
- c. $A - B$ is nonsingular. ✔
- d. A and B are singular.

The correct answer is: $A - B$ is nonsingular.

Question 16
Correct
Mark 1.00 out of 1.00

If $A = \begin{pmatrix} 1 & -2 & 5 \\ 4 & -11 & 8 \\ -3 & 3 & -27 \end{pmatrix}$ and $b = \begin{pmatrix} b_1 \\ b_2 \\ b_3 \end{pmatrix}$, then the system $Ax = b$ is consistent if and only if

Select one:

a. $7b_1 - b_2 + b_3 \neq 1$

b. $7b_1 - b_2 + b_3 \neq 0$

c. $7b_1 - b_2 + b_3 = 1$

d. $7b_1 - b_2 + b_3 = 0$ ✔

The correct answer is: $7b_1 - b_2 + b_3 = 0$

Question 17
Correct
Mark 1.00 out of 1.00

Any two $n \times n$-nonsingular matrices are row equivalent.

Select one:

a. False

b. True ✔

The correct answer is: True

Question 18
Correct
Mark 1.00 out of 1.00

A square matrix A is nonsingular iff its RREF (reduced row echelon form) is the identity matrix.

Select one:

a. True ✔

b. False

The correct answer is: True

Question **19**

Correct

Mark 1.00 out of 1.00

If the row echelon form of $(A|b)$ is $\begin{pmatrix} 1 & 0 & -2 & -1 & | & -2 \\ 0 & 1 & 1 & -1 & | & -1 \\ 0 & 0 & 1 & 1 & | & 0 \end{pmatrix}$ then the general form of the solutions is given by

Select one:

- a. $x = \begin{pmatrix} -2-\alpha \\ 1-\alpha \\ \alpha \\ \alpha \end{pmatrix}$
- b. $x = \begin{pmatrix} -2-\alpha \\ -1+2\alpha \\ -\alpha \\ \alpha \end{pmatrix}$ ✔
- c. $x = \begin{pmatrix} \alpha \\ 2-\alpha \\ \alpha \\ \alpha \end{pmatrix}$
- d. $x = \begin{pmatrix} -2-\alpha \\ 1-\alpha \\ \alpha \\ 1 \end{pmatrix}$

The correct answer is: $x = \begin{pmatrix} -2-\alpha \\ -1+2\alpha \\ -\alpha \\ \alpha \end{pmatrix}$

Question **20**

Incorrect

Mark 0.00 out of 1.00

If A is a 3×3 matrix with $\det(A) = -1$. Then $\det(adj(A)) =$

Select one:

- a. 3. ✖
- b. 1.
- c. -1.
- d. -3.

The correct answer is: 1.

Question **21**

Correct

Mark 1.00 out of 1.00

If A is a 3×3 matrix such that $det(A) = 2$, then $\det(3A) = 6$

Select one:

- a. True
- b. False ✔

The correct answer is: False

Question **22**

Correct

Mark 1.00 out of 1.00

If A is a 3×5 matrix, then the system $Ax = 0$

Select one:

- a. is inconsistent
- b. has infinitely many solutions
- c. has no solution.
- d. has only the zero solution

The correct answer is: has infinitely many solutions

Question **23**

Correct

Mark 1.00 out of 1.00

Let U be an $n \times n$-matrix in reduced row echelon form and $U \neq I$, then

Select one:

- a. $\det(U) = 1$
- b. The system $Ux = 0$ has only the zero solution.
- c. U is the zero matrix
- d. The system $Ux = 0$ has infinitely many solutions

The correct answer is: The system $Ux = 0$ has infinitely many solutions

Question **24**

Incorrect

Mark 0.00 out of 1.00

Let A be a 3×3-matrix with $a_1 = a_2$. If $b = a_2 - a_3$, where a_1, a_2, a_3 ar the columns of A, then a solution to the system $Ax = b$ is

Select one:

- a. $x = \begin{pmatrix} 1 \\ 0 \\ -1 \end{pmatrix}$
- b. $x = \begin{pmatrix} 1 \\ 1 \\ -1 \end{pmatrix}$
- c. $x = \begin{pmatrix} 1 \\ 1 \\ 0 \end{pmatrix}$
- d. $x = \begin{pmatrix} 0 \\ 0 \\ 2 \end{pmatrix}$

The correct answer is: $x = \begin{pmatrix} 1 \\ 0 \\ -1 \end{pmatrix}$

Question **25**

Correct

Mark 1.00 out of 1.00

If A is an $n \times n$ matrix and the system $Ax = b$ has infinitely many solutions, then

Select one:

a. A is nonsingular

b. A has a row of zeros

c. A is symmetric

d. A singular ✔

The correct answer is: A singular

Question **26**

Correct

Mark 1.00 out of 1.00

Let A be a 4×4-matrix such that $A \begin{bmatrix} 1 \\ 2 \\ 3 \\ 4 \end{bmatrix} = \begin{bmatrix} 0 \\ 0 \\ 0 \\ 0 \end{bmatrix}$, then

Select one:

a. A is the zero matrix

b. A is singular. ✔

c. The system $Ax = 0$ has only one solution

d. There are elementary matrices $E_1, E_2, \cdots, E_k$ such that $A = E_1 E_2 \cdots E_k$

The correct answer is: A is singular.

Question **27**

Incorrect

Mark 0.00 out of 1.00

If B is a 3×3 nonsingular matrix such that $B^3 = B$, then one of the following is always true

Select one:

a. $B^4 = B$.

b. $\det(B) = 1$. ✖

c. $B = 0$.

d. $B = B^{-1}$.

The correct answer is: $B = B^{-1}$.

Question **28**

Incorrect

Mark 0.00 out of 1.00

If A is a singular $n \times n$-matrix, $b \in \mathbb{R}^n$, then the system $Ax = b$

Select one:

a. is inconsistent

b. has a unique solution ✖

c. has infinitely many solutions.

d. has either no solution or an infinite number of solutions

The correct answer is: has either no solution or an infinite number of solutions

Question **29**

Correct

Mark 1.00 out of 1.00

Let $A = \begin{pmatrix} 1 & 2 & 3 & 0 \\ 1 & 1 & 2 & 1 \\ 2 & 3 & 5 & 1 \end{pmatrix}$ and $b = \begin{pmatrix} 2 \\ 1 \\ 4 \end{pmatrix}$. The system $Ax = b$

Select one:

- a. has exactly three solutions.
- b. has a unique solution
- c. is inconsistent ✔
- d. has infinitely many solutions

The correct answer is: is inconsistent

Question **30**

Correct

Mark 1.00 out of 1.00

Let $(1,2,0)^T$ and $(2,1,1)^T$ be the first two columns of a 3×3 matrix A and $(1,1,1)^T$ be a solution of the system $Ax = (2,1,-1)^T$. Then the third column of the matrix A is

Select one:

- a. $(1,2,2)^T$.
- b. $(-1,-2,-2)^T$.
  ✔
- c. $(4,-1,1)^T$.
- d. $(1,1,0)^T$.

The correct answer is: $(-1,-2,-2)^T$.

Started on	Sunday, 11 April 2021, 8:35 AM
State	Finished
Completed on	Sunday, 11 April 2021, 9:03 AM
Time taken	27 mins 45 secs
Grade	**10.00** out of 12.00 (**83**%)

Question **1**

Correct

Mark 1.00 out of 1.00

If x_1, x_2 are solutions to $Ax = b$, then $x_1 + x_2$ is a solution of the system $Ax = b$.

Select one:

a. False

b. True

The correct answer is: False

Question **2**

Correct

Mark 1.00 out of 1.00

Let A be an $n \times n$-matrix in reduced row echelon form and $A \neq I$, then

Select one:

a. A is nonsingular

b. $\det(A) = 1$

c. A is the zero matrix

d. A is singular

The correct answer is: A is singular

Question **3**

Incorrect

Mark 0.00 out of 1.00

If A is a singular matrix and U is the row echelon form of A, then $\det(U) =$.

Select one:

- a. 1
- b. none of the above
- c. ± 1
- d. 0

The correct answer is: 0

Question **4**

Correct

Mark 1.00 out of 1.00

If x_1, x_2 are solutions to $Ax = b$, then $x_1 - x_2$ is a solution of the system $Ax = b$.

Select one:

- a. False
- b. True

The correct answer is: False

Question **5**

Correct

Mark 1.00 out of 1.00

If $AB = AC$, and $|A| \neq 0$, then

Select one:

- a. $B = C$.
- b. $B \neq C$
- c. $A = C$

The correct answer is: $B = C$.

Question **6**

Correct

Mark 1.00 out of 1.00

In the square linear system $AX = b$, if A is singular and b is a linear combination of the columns of A then the system has

Select one:

- a. no solution
- b. a unique solution
- c. infinitely many solutions ✔
- d. can not tell

The correct answer is: infinitely many solutions

Question **7**

Correct

Mark 1.00 out of 1.00

If B is a 3×3 nonsingular matrix such that $B^3 = B$, then one of the following is always true

Select one:

- a. $B^4 = B$.
- b. $B = 0$.
- c. $\det(B) = 1$.
- d. $B = B^{-1}$. ✔

The correct answer is: $B = B^{-1}$.

Question **8**

Correct

Mark 1.00 out of 1.00

If A is a nonsingular 3×3-matrix, then the reduced row echelon form of A has no row of zeros.

Select one:

- a. False
- b. True ✔

The correct answer is: True

Question **9**

Incorrect

Mark 0.00 out of 1.00

Let $A = \begin{pmatrix} 1 & 1 & 0 \\ 1 & a & 1 \\ 1 & 1 & 2 \end{pmatrix}$. the value(s) of a that make A nonsingular

Select one:

- a. $a \neq \frac{1}{2}$ ✗
- b. $a = 1$
- c. $a \neq 1$
- d. $a = \frac{1}{2}$

The correct answer is: $a \neq 1$

Question **10**

Correct

Mark 1.00 out of 1.00

Let A be a 3×4 matrix, and let B be a 4×4 matrix which has a column of zeros, then AB has a column of zeros.

Select one:

- a. False
- b. True ✓

The correct answer is: True

Question **11**

Correct

Mark 1.00 out of 1.00

Let $(1, 2, 0)^T$ and $(2, 1, 1)^T$ be the first two columns of a 3×3 matrix A and $(1, 1, 1)^T$ be a solution of the system $Ax = (4, 2, 5)^T$. Then the third column of the matrix A is

Select one:

- a. $(1, -1, 4)^T$. ✓
- b. $(4, -1, 1)^T$.
- c. $(1, -1, -4)^T$.
- d. $(1, 1, 4)^T$.

The correct answer is: $(1, -1, 4)^T$.

Question **12**

Correct

Mark 1.00 out of 1.00

Let $A = \begin{pmatrix} 1 & -1 & 1 \\ 3 & -2 & 2 \\ -2 & 4 & 3 \end{pmatrix}$, then $\det(A) =$

Select one:

- a. 7
- b. 5
- c. 0
- d. 9

The correct answer is: 7

Started on	Tuesday, 24 November 2020, 3:50 PM
State	Finished
Completed on	Tuesday, 24 November 2020, 4:53 PM
Time taken	1 hour 2 mins
Grade	**28.00** out of 30.00 (**93**%)

Question **1**
Correct
Mark 1.00 out of 1.00

An $n \times n$ matrix A is invertible if and only if

Select one:
- a. $|A| = 0$
- b. $Ax = 0$ has a nonzero solution
- c. $A = I$
- d. there exists a matrix B such that $AB = I$ ✔

The correct answer is: there exists a matrix B such that $AB = I$

Question **2**
Correct
Mark 1.00 out of 1.00

$(0, 0, 0)^T$ is a linear combination of the vectors $(1, 2, 3)^T, (1, 4, 1)^T, (2, 3, 1)^T$

Select one:
- a. True ✔
- b. False

The correct answer is: True

Question **3**
Correct
Mark 1.00 out of 1.00

In the $n \times n$-linear system $Ax = b$, if A is singular and b is a linear combination of the columns of A then the system has

Select one:
- a. exactly two solutions
- b. no solution
- c. a unique solution
- d. infinitely many solutions ✔

The correct answer is: infinitely many solutions

Question **4**
Correct
Mark 1.00 out of 1.00

If y, z are solutions to $Ax = b$, then $y + z$ is a solution of the system $Ax = 0$.

Select one:
- a. True
- b. False ✔

The correct answer is: False

Question 5
Incorrect
Mark 0.00 out of 1.00

Any two $n \times n$-singular matrices are row equivalent.

Select one:
- a. False
- b. True ✖

The correct answer is: False

Question 6
Correct
Mark 1.00 out of 1.00

If A is a 4×3-matrix, $b \in \mathbb{R}^4$, and the system $Ax = b$ is consistent, then $Ax = b$ has a unique solution.

Select one:
- a. True
- b. False ✔

The correct answer is: False

Question 7
Correct
Mark 1.00 out of 1.00

If $(A|b) = \begin{pmatrix} 1 & 2 & -1 & | & 0 \\ 2 & 3 & 1 & | & -1 \\ 1 & 1 & \alpha & | & \beta \end{pmatrix}$, then the system has only one solution if

Select one:
- a. $\alpha \neq 2$ and β any number ✔
- b. $\alpha \neq 2$ and $\beta \neq -1$
- c. $\alpha = 2$ and $\beta = -1$
- d. $\alpha = 2$ and $\beta \neq -1$

The correct answer is: $\alpha \neq 2$ and β any number

Question 8
Correct
Mark 1.00 out of 1.00

If A is a nonsingular 3×3-matrix, then the reduced row echelon form of A has no row of zeros.

Select one:
- a. False
- b. True ✔

The correct answer is: True

Question 9
Correct
Mark 1.00 out of 1.00

If E is an elementary matrix then one of the following statements is not true

Select one:
- a. E^{-1} is an elementary matrix.
- b. E is nonsingular.
- c. E^T is an elementary matrix.
- d. $E + E^T$ is an elementary matrix. ✔

The correct answer is: $E + E^T$ is an elementary matrix.

Question **10**

Correct

Mark 1.00 out of 1.00

If A is a 3×3 matrix with $\det(A) = -2$. Then $\det(adj(A)) =$

Select one:

- a. 4. ✔
- b. -4.
- c. -8.
- d. 8.

The correct answer is: 4.

Question **11**

Correct

Mark 1.00 out of 1.00

If A is singular and B is nonsingular $n \times n$-matrices, then AB is

Select one:

- a. singular ✔
- b. may or may not be singular
- c. nonsingular

The correct answer is: singular

Question **12**

Correct

Mark 1.00 out of 1.00

If $(A|b) = \left(\begin{array}{ccc|c} 1 & 1 & 2 & 4 \\ 2 & -1 & 2 & 6 \\ 1 & 1 & 2 & 5 \end{array}\right)$, then the system $Ax = b$ is inconsistent

Select one:

- a. True ✔
- b. False

The correct answer is: True

Question **13**

Correct

Mark 1.00 out of 1.00

If A is a singular $n \times n$-matrix, $b \in \mathbb{R}^n$, then the system $Ax = b$

Select one:

- a. has either no solution or an infinite number of solutions ✔
- b. has infinitely many solutions.
- c. has a unique solution
- d. is inconsistent

The correct answer is: has either no solution or an infinite number of solutions

Question **14**

Correct

Mark 1.00 out of 1.00

If A is symmetric and skew symmetric then $A = 0$. (A is skew symmetric if $A = -A^T$).

Select one:

- a. True ✔
- b. False

The correct answer is: True

Question **15**

Correct

Mark 1.00 out of 1.00

If $A = LU$ is the LU-factorization of a matrix A, and A is singular, then

Select one:

a. L and U are both singular

b. U is singular and L is nonsingular ✔

c. L and U are both nonsingular

d. L is singular and U is nonsingular

The correct answer is: U is singular and L is nonsigular

Question **16**

Correct

Mark 1.00 out of 1.00

If A and B are singular matrices, then $A + B$ is also singular.

Select one:

a. False ✔

b. True

The correct answer is: False

Question **17**

Correct

Mark 1.00 out of 1.00

If A is a singular matrix, then A can be written as a product of elementary matrices.

Select one:

a. False ✔

b. True

The correct answer is: False

Question **18**

Correct

Mark 1.00 out of 1.00

Let $(1, 2, 0)^T$ and $(2, 1, 1)^T$ be the first two columns of a 3×3 matrix A and $(1, 1, 1)^T$ be a solution of the system $Ax = (4, 4, 5)^T$. Then the third column of the matrix A is

Select one:

a. $(1, 1, 4)^T$. ✔

b. $(4, -1, 1)^T$.

c. $(-1, -1, -4)^T$.

d. $(-1, -2, 1)^T$.

The correct answer is: $(1, 1, 4)^T$.

Question **19**

Correct

Mark 1.00 out of 1.00

Let A be a 3×4 matrix which has a row of zeros, and let B be a 4×4 matrix , then AB has a row of zeros.

Select one:

a. True ✔

b. False

The correct answer is: True

Question 20

Correct

Mark 1.00 out of 1.00

Let A be a 4×4-matrix such that $A \begin{bmatrix} 1 \\ 2 \\ 3 \\ 4 \end{bmatrix} = \begin{bmatrix} 0 \\ 0 \\ 0 \\ 0 \end{bmatrix}$, then

Select one:

- a. There are elementary matrices $E_1, E_2, \cdots, E_k$ such that $A = E_1 E_2 \cdots E_k$
- b. A is the zero matrix
- c. The system $Ax = 0$ has only one solution
- d. A is singular.

The correct answer is: A is singular.

Question 21

Correct

Mark 1.00 out of 1.00

If E is an elementary matrix of type III, then E^T is

Select one:

- a. an elementary matrix of type I
- b. an elementary matrix of type II
- c. not an elementary matrix
- d. an elementary matrix of type III

The correct answer is: an elementary matrix of type III

Question 22

Correct

Mark 1.00 out of 1.00

Let $A = \begin{pmatrix} 1 & -1 & 1 \\ 3 & -2 & 2 \\ -2 & -1 & 3 \end{pmatrix}$, then $\det(A) =$

Select one:

- a. 2
- b. 3
- c. 5
- d. 0

The correct answer is: 2

Question 23

Correct

Mark 1.00 out of 1.00

If the row echelon form of $(A|b)$ is $\begin{pmatrix} 1 & 0 & -2 & -1 & | & -2 \\ 0 & 1 & 1 & -1 & | & -1 \\ 0 & 0 & 1 & 1 & | & 0 \end{pmatrix}$ then the general form of the solutions is given by

Select one:

a. $x = \begin{pmatrix} -2-\alpha \\ 1-\alpha \\ \alpha \\ \alpha \end{pmatrix}$

b. $x = \begin{pmatrix} -2-\alpha \\ 1-\alpha \\ \alpha \\ 1 \end{pmatrix}$

c. $x = \begin{pmatrix} -2-\alpha \\ -1+2\alpha \\ -\alpha \\ \alpha \end{pmatrix}$ ✔

d. $x = \begin{pmatrix} \alpha \\ 2-\alpha \\ \alpha \\ \alpha \end{pmatrix}$

The correct answer is: $x = \begin{pmatrix} -2-\alpha \\ -1+2\alpha \\ -\alpha \\ \alpha \end{pmatrix}$

Question 24

Correct

Mark 1.00 out of 1.00

If A, B are $n \times n$-skew-symmetric matrices(A is skew symmetric if $A^T = -A$), then $AB + BA$ is symmetric

Select one:

a. True ✔

b. False

The correct answer is: True

Question 25

Correct

Mark 1.00 out of 1.00

Let A be a 4×3-matrix with $a_2 - a_3 = 0$. If $b = a_1 + a_2 + a_3$, where a_j is the jth column of A, then the system $Ax = b$ will have infinitely many solutions.

Select one:

a. False

b. True ✔

The correct answer is: True

Question **26**

Correct

Mark 1.00 out of 1.00

If A is a 3×3-matrix and the system $Ax = \begin{pmatrix} 5 \\ 1 \\ 3 \end{pmatrix}$ has a unique solution, then the system $Ax = \begin{pmatrix} 0 \\ 0 \\ 0 \end{pmatrix}$

Select one:

- a. is inconsistent
- b. has only the zero solution. ✔
- c. has infinitely many solutions

The correct answer is: has only the zero solution.

Question **27**

Incorrect

Mark 0.00 out of 1.00

If $AB = 0$, where A and B are $n \times n$ nonzero matrices. Then

Select one:

- a. either A or B is singular ✖
- b. both A, B are singular.
- c. both A, B are nonsingular.
- d. either $A = 0$ or $B = 0$

The correct answer is: both A, B are singular.

Question **28**

Correct

Mark 1.00 out of 1.00

If x_0 is a solution of the nonhomogeneous system $Ax = b$ and x_1 is a solution of the homogeneous system $Ax = 0$. Then $x_1 + x_0$ is a solution of

Select one:

- a. the system $Ax = 0$
- b. the system $Ax = 2b$
- c. the system $Ax = Ab$
- d. the system $Ax = b$ ✔

The correct answer is: the system $Ax = b$

Question **29**

Correct

Mark 1.00 out of 1.00

If A is a nonsingular $n \times n$ matrix, $b \in \mathbb{R}^n$, then

Select one:

- a. The system $Ax = b$ is inconsistent
- b. The system $Ax = b$ has only two solutions
- c. The system $Ax = b$ has a unique solution ✔
- d. The system $Ax = b$ has infinitely many solutions

The correct answer is: The system $Ax = b$ has a unique solution

Question **30**

Correct

Mark 1.00 out of 1.00

The adjoint of the matrix $\begin{pmatrix} -1 & 2 \\ 1 & 3 \end{pmatrix}$ is

Select one:

a. $\begin{pmatrix} -1 & 1 \\ 2 & -3 \end{pmatrix}$

b. $\begin{pmatrix} 1 & -2 \\ -1 & -3 \end{pmatrix}$

c. $\begin{pmatrix} 3 & -2 \\ -1 & -1 \end{pmatrix}$ ✔

d. $\begin{pmatrix} 1 & 1 \\ 2 & 3 \end{pmatrix}$

The correct answer is: $\begin{pmatrix} 3 & -2 \\ -1 & -1 \end{pmatrix}$

Started on	Tuesday, 24 November 2020, 3:51 PM
State	Finished
Completed on	Tuesday, 24 November 2020, 4:48 PM
Time taken	57 mins 9 secs
Grade	**28.00** out of 30.00 (**93**%)

Question **1**

Correct

Mark 1.00 out of 1.00

Let $A = \begin{pmatrix} 1 & -1 & 1 \\ 3 & -2 & 2 \\ -2 & 4 & 3 \end{pmatrix}$, then $\det(A) =$

Select one:

- a. 0
- b. 9
- c. 5
- d. 7 ✔

The correct answer is: 7

Question **2**

Correct

Mark 1.00 out of 1.00

If A is a 2×3-matrix, and $b = a_2$ (second column of A), then a solution to the system $Ax = b$ is

Select one:

- a. $x = \begin{pmatrix} 1 \\ 0 \\ 0 \\ 0 \end{pmatrix}$
- b. $x = \begin{pmatrix} 1 \\ 0 \\ 0 \end{pmatrix}$
- c. $x = \begin{pmatrix} 0 \\ 1 \\ 0 \\ 0 \end{pmatrix}$
- d. $x = \begin{pmatrix} 0 \\ 1 \\ 0 \end{pmatrix}$ ✔

The correct answer is: $x = \begin{pmatrix} 0 \\ 1 \\ 0 \end{pmatrix}$

Question 3

Correct

Mark 1.00 out of 1.00

If A is a 2×2 matrix with $\det(A) = -2$. Then $\det(adj(A)) =$

Select one:

- a. 2.
- b. -2.
- c. -4.
- d. 4.

The correct answer is: -2.

Question 4

Correct

Mark 1.00 out of 1.00

If A, B, C are $n \times n$ nonsingular matrices, then $A^2 - B^2 = (A + B)(A - B)$.

Select one:

- a. False
- b. True

The correct answer is: False

Question 5

Correct

Mark 1.00 out of 1.00

If A is a singular matrix, then A can be written as a product of elementary matrices.

Select one:

- a. False
- b. True

The correct answer is: False

Question 6

Correct

Mark 1.00 out of 1.00

The adjoint of the matrix $\begin{pmatrix} 5 & 2 \\ -1 & 6 \end{pmatrix}$ is

Select one:

- a. $\begin{pmatrix} 5 & -1 \\ 2 & 6 \end{pmatrix}$
- b. $\begin{pmatrix} 6 & -2 \\ 1 & 5 \end{pmatrix}$
- c. $\begin{pmatrix} -5 & -1 \\ 2 & -6 \end{pmatrix}$
- d. $\begin{pmatrix} -6 & 2 \\ -1 & -5 \end{pmatrix}$

The correct answer is: $\begin{pmatrix} 6 & -2 \\ 1 & 5 \end{pmatrix}$

Question **7**

Correct

Mark 1.00 out of 1.00

If A and B are $n \times n$ matrices such that $Ax \neq Bx$ for all nonzero $x \in \mathbb{R}^n$. Then

Select one:

- a. A and B are singular.
- b. $A - B$ is singular.
- c. A and B are nonsingular.
- d. $A - B$ is nonsingular. ✔

The correct answer is: $A - B$ is nonsingular.

Question **8**

Incorrect

Mark 0.00 out of 1.00

If y, z are solutions to $Ax = b$, then $\frac{1}{3}y + \frac{3}{4}z$ is a solution of the system $Ax = b$.

Select one:

- a. False
- b. True ✖

The correct answer is: False

Question **9**

Correct

Mark 1.00 out of 1.00

Let A be a 4×4-matrix such that $A \begin{bmatrix} 1 \\ 2 \\ 3 \\ 4 \end{bmatrix} = \begin{bmatrix} 0 \\ 0 \\ 0 \\ 0 \end{bmatrix}$, then

Select one:

- a. There are elementary matrices $E_1, E_2, \cdots, E_k$ such that $A = E_1 E_2 \cdots E_k$
- b. The system $Ax = 0$ has only one solution
- c. A is singular. ✔
- d. A is the zero matrix

The correct answer is: A is singular.

Question **10**

Correct

Mark 1.00 out of 1.00

If A is symmetric and skew symmetric then $A = 0$. (A is skew symmetric if $A = -A^T$).

Select one:

- a. False
- b. True ✔

The correct answer is: True

Question **11**

Correct

Mark 1.00 out of 1.00

An $n \times n$ matrix A is invertible if and only if

Select one:

- a. there exists a matrix B such that $AB = I$ ✔
- b. $A = I$
- c. $|A| = 0$
- d. $Ax = 0$ has a nonzero solution

The correct answer is: there exists a matrix B such that $AB = I$

Question **12**

Correct

Mark 1.00 out of 1.00

If A, B, C are $n \times n$-matrices with A nonsigular and $AB = AC$, then $B = C$

Select one:

- a. False
- b. True ✔

The correct answer is: True

Question **13**

Correct

Mark 1.00 out of 1.00

In the square linear system $Ax = b$, if A is singular and b is not a linear combination of the columns of A then the system

Select one:

- a. has a unique solution
- b. has infinitely many solutions
- c. can not tell
- d. has no solution ✔

The correct answer is: has no solution

Question **14**

Correct

Mark 1.00 out of 1.00

Any two $n \times n$-singular matrices are row equivalent.

Select one:

- a. False ✔
- b. True

The correct answer is: False

Question **15**

Correct

Mark 1.00 out of 1.00

If A is a singular $n \times n$-matrix, $b \in \mathbb{R}^n$, then the system $Ax = b$

Select one:

- a. is inconsistent
- b. has a unique solution
- c. has either no solution or an infinite number of solutions ✔
- d. has infinitely many solutions.

The correct answer is: has either no solution or an infinite number of solutions

Question **16**

Correct

Mark 1.00 out of 1.00

Let A be a 3×4 matrix which has a row of zeros, and let B be a 4×4 matrix , then AB has a row of zeros.

Select one:

- a. True ✔
- b. False

The correct answer is: True

Question **17**

Correct

Mark 1.00 out of 1.00

If E is an elementary matrix of type III, then E^T is

Select one:

- a. an elementary matrix of type II
- b. an elementary matrix of type I
- c. an elementary matrix of type III ✔
- d. not an elementary matrix

The correct answer is: an elementary matrix of type III

Question **18**

Correct

Mark 1.00 out of 1.00

If the row echelon form of $(A|b)$ is $\begin{pmatrix} 1 & 0 & -2 & -1 & | & -2 \\ 0 & 1 & 1 & -1 & | & -1 \\ 0 & 0 & 1 & 1 & | & 0 \end{pmatrix}$ then the general form of the solutions is given by

Select one:

- a. $x = \begin{pmatrix} -2-\alpha \\ 1-\alpha \\ \alpha \\ \alpha \end{pmatrix}$
- b. $x = \begin{pmatrix} -2-\alpha \\ 1-\alpha \\ \alpha \\ 1 \end{pmatrix}$
- c. $x = \begin{pmatrix} -2-\alpha \\ -1+2\alpha \\ -\alpha \\ \alpha \end{pmatrix}$ ✔
- d. $x = \begin{pmatrix} \alpha \\ 2-\alpha \\ \alpha \\ \alpha \end{pmatrix}$

The correct answer is: $x = \begin{pmatrix} -2-\alpha \\ -1+2\alpha \\ -\alpha \\ \alpha \end{pmatrix}$

Question **19**

Incorrect

Mark 0.00 out of 1.00

If $(A|b) = \begin{pmatrix} 1 & 1 & 2 & | & 4 \\ 2 & -1 & 2 & | & 6 \\ 0 & 3 & 2 & | & 1 \end{pmatrix}$ is the augmented matrix of the system $Ax = b$ then the system has no solution

Select one:

- a. False ✖
- b. True

The correct answer is: True

Question **20**

Correct

Mark 1.00 out of 1.00

If $(A|b) = \begin{pmatrix} 1 & 2 & -1 & | & 0 \\ 2 & 3 & 1 & | & -1 \\ 1 & 1 & \alpha & | & \beta \end{pmatrix}$, then the system is inconsistent if

Select one:

- a. $\alpha \neq 2$ and $\beta \neq -1$
- b. $\alpha \neq 2$ and β any number
- c. $\alpha = 2$ and $\beta = -1$
- d. $\alpha = 2$ and $\beta \neq -1$ ✔

The correct answer is: $\alpha = 2$ and $\beta \neq -1$

Question **21**

Correct

Mark 1.00 out of 1.00

Let $(1, 2, 0)^T$ and $(2, 1, 1)^T$ be the first two columns of a 3×3 matrix A and $(1, 1, 1)^T$ be a solution of the system $Ax = (5, 2, 4)^T$. Then the third column of the matrix A is

Select one:

- a. $(-2, 1, -3)^T$.
- b. $(1, -1, -4)^T$.
- c. $(2, -1, 3)^T$. ✔
- d. $(1, -1, 4)^T$.

The correct answer is: $(2, -1, 3)^T$.

Question **22**

Correct

Mark 1.00 out of 1.00

If A is a nonsingular $n \times n$ matrix, then

Select one:

- a. There are elementary matrices $E_1, E_2, \cdots, E_k$ such that $A = E_1 E_2 \cdots E_k$. ✔
- b. $\det(A) = 1$
- c. There is a singular matrix C such that $A = CI$.
- d. The system $Ax = 0$ has a nontrivial (nonzero) solution.

The correct answer is: There are elementary matrices $E_1, E_2, \cdots, E_k$ such that $A = E_1 E_2 \cdots E_k$.

Question 23
Correct
Mark 1.00 out of 1.00

If A is a symmetric $n \times n$-matrix and P any $n \times n$-matrix, then PAP^T is

Select one:
- a. symmetric ✔
- b. not defined
- c. singular
- d. not symmetric

The correct answer is: symmetric

Question 24
Correct
Mark 1.00 out of 1.00

If A is an $n \times n$ matrix and the system $Ax = b$ has infinitely many solutions, then

Select one:
- a. A is symmetric
- b. A has a row of zeros
- c. A singular ✔
- d. A is nonsingular

The correct answer is: A singular

Question 25
Correct
Mark 1.00 out of 1.00

If A is a 3×3 matrix such that $det(A) = 2$, then $\det(3A) = 6$

Select one:
- a. False ✔
- b. True

The correct answer is: False

Question 26
Correct
Mark 1.00 out of 1.00

If A, B, C are 3×3-matrices, $\det(A) = 9, \det(B) = 2, \det(C) = 3$, then $\det(3C^T BA^{-1}) =$

Select one:
- a. 6
- b. 18 ✔
- c. 16
- d. 2

The correct answer is: 18

Question 27
Correct
Mark 1.00 out of 1.00

If A and B are singular matrices, then $A + B$ is also singular.

Select one:
- a. False ✔
- b. True

The correct answer is: False

Question 28
Correct
Mark 1.00 out of 1.00

In the $n \times n$-linear system $Ax = b$, if A is singular and b is a linear combination of the columns of A then the system has

Select one:
- a. no solution
- b. a unique solution
- c. infinitely many solutions ✔
- d. exactly two solutions

The correct answer is: infinitely many solutions

Question 29
Correct
Mark 1.00 out of 1.00

If A is a 4×3-matrix, $b \in \mathbb{R}^4$, and the system $Ax = b$ is consistent, then $Ax = b$ has a unique solution.

Select one:
- a. False ✔
- b. True

The correct answer is: False

Da
Sy

Question 30
Correct
Mark 1.00 out of 1.00

If A is a 3×3-matrix and the system $Ax = \begin{pmatrix} 5 \\ 1 \\ 3 \end{pmatrix}$ has a unique solution, then the system $Ax = \begin{pmatrix} 0 \\ 0 \\ 0 \end{pmatrix}$

Select one:
- a. has infinitely many solutions
- b. has only the zero solution. ✔
- c. is inconsistent

The correct answer is: has only the zero solution.

Question **1**

Incorrect

Mark 0.00 out of 1.00

If A is a 4×3-matrix, $b\in\mathbb{R}^4$, and the system $Ax=b$ is consistent, then $Ax=b$ has a unique solution.

Select one:

- a. False
- b. True ✖

The correct answer is: False

Question **2**

Incorrect

Mark 0.00 out of 1.00

If A is a singular matrix, then the system $Ax=b$ has infinite number of solutions

Select one:

- a. True ✖
- b. False

The correct answer is: False

α

Question **4**

Correct

Mark 1.00 out of 1.00

If $(A|b) = \begin{pmatrix} 1 & 2 & -1 & | & 0 \\ 2 & 3 & 1 & | & -1 \\ 1 & 1 & \alpha & | & \beta \end{pmatrix}$, then the system has infinite number of solutions if

Select one:

- a. $\alpha \neq 2$ and β any number
- b. $\alpha = 2$ and $\beta \neq -1$
- c. $\alpha = 2$ and $\beta = -1$ ✔
- d. $\alpha \neq 2$ and $\beta \neq -1$

The correct answer is: $\alpha = 2$ and $\beta = -1$

Question **5**

Correct

Mark 1.00 out of 1.00

Let $A = \begin{pmatrix} 1 & -1 & 1 \\ 3 & -2 & 2 \\ -2 & 1 & 3 \end{pmatrix}$, then $\det(A) =$

Select one:

- a. 4 ✔
- b. 0
- c. 8
- d. 1

The correct answer is: 4

Question **6**

Correct

Mark 1.00 out of 1.00

If $(A|b) = \begin{pmatrix} 1 & 1 & 2 & | & 4 \\ 2 & -1 & 2 & | & 6 \\ 1 & 1 & 2 & | & 5 \end{pmatrix}$, then the system $Ax = b$ is inconsistent

Select one:

- a. False
- b. True ✔

The correct answer is: True

Question **7**

Incorrect

Mark 0.00 out of 1.00

If a matrix B is obtained from A by multiplying a row of A by a real number c, then $|A| = c|B|$.

Select one:

- a. False
- b. True ✖

The correct answer is: False

Question **8**

Incorrect

Mark 0.00 out of 1.00

In the square linear system $Ax = b$, if A is singular and b is not a linear combination of the columns of A then the system

Select one:

- a. can not tell
- b. has a unique solution
- c. has infinitely many solutions ✖
- d. has no solution

The correct answer is: has no solution

Question **9**

Correct

Mark 1.00 out of 1.00

If E is an elementary matrix of type III, then E^T is

Select one:

- a. not an elementary matrix
- b. an elementary matrix of type III ✔
- c. an elementary matrix of type I
- d. an elementary matrix of type II

The correct answer is: an elementary matrix of type III

Question **10**

Correct

Mark 1.00 out of 1.00

If $AB = 0$, where A and B are $n \times n$ nonzero matrices. Then

Select one:

- a. both A, B are nonsingular.
- b. both A, B are singular. ✔
- c. either A or B is singular
- d. either $A = 0$ or $B = 0$

The correct answer is: both A, B are singular.

Question **11**

Correct

Mark 1.00 out of 1.00

If A, B are $n \times n$-skew-symmetric matrices(A is skew symmetric if $A^T = -A$), then $AB + BA$ is symmetric

Select one:

- a. False
- b. True ✔

The correct answer is: True

Question **12**

Correct

Mark 1.00 out of 1.00

If A is a 3×3 matrix such that $det(A) = 2$, then $\det(3A) = 6$

Select one:

- a. True
- b. False ✔

The correct answer is: False

Question **13**

Correct

Mark 1.00 out of 1.00

The adjoint of the matrix $\begin{pmatrix} 2 & 5 \\ 1 & 3 \end{pmatrix}$ is

Select one:

a. $\begin{pmatrix} -5 & 3 \\ 2 & -1 \end{pmatrix}$

b. $\begin{pmatrix} -3 & 5 \\ 1 & -2 \end{pmatrix}$

c. $\begin{pmatrix} 3 & -5 \\ -1 & 2 \end{pmatrix}$ ✔

d. $\begin{pmatrix} -2 & 1 \\ 5 & -3 \end{pmatrix}$

The correct answer is: $\begin{pmatrix} 3 & -5 \\ -1 & 2 \end{pmatrix}$

Question **14**

Correct

Mark 1.00 out of 1.00

Let $(1, 2, 0)^T$ and $(2, 1, 1)^T$ be the first two columns of a 3×3 matrix A and $(1, 1, 1)^T$ be a solution of the system $Ax = (2, 1, 3)^T$. Then the third column of the matrix A is

Select one:

a. $(1, 1, 0)^T$.

b. $(-1, -2, 2)^T$. ✔

c. $(4, -1, 1)^T$.

d. $(-1, -1, 2)^T$.

The correct answer is: $(-1, -2, 2)^T$.

Question **15**

Correct

Mark 1.00 out of 1.00

$(0, 0, 0)^T$ is a linear combination of the vectors $(1, 2, 3)^T, (1, 4, 1)^T, (2, 3, 1)^T$

Select one:

a. True ✔

b. False

The correct answer is: True

Question **16**

Correct

Mark 1.00 out of 1.00

Let A be a 4×4-matrix such that $A \begin{bmatrix} 1 \\ 2 \\ 3 \\ 4 \end{bmatrix} = \begin{bmatrix} 0 \\ 0 \\ 0 \\ 0 \end{bmatrix}$, then

Select one:

a. There are elementary matrices $E_1, E_2, \cdots, E_k$ such that $A = E_1 E_2 \cdots E_k$

b. A is singular. ✔

c. A is the zero matrix

d. The system $Ax = 0$ has only one solution

The correct answer is: A is singular.

Question **17**

Incorrect

Mark 0.00 out of 1.00

Let A be a 3×4 matrix which has a row of zeros, and let B be a 4×4 matrix , then AB has a row of zeros.

Select one:

a. False ✖

b. True

The correct answer is: True

Question **18**

Incorrect

Mark 0.00 out of 1.00

If A is a 4×3 matrix such that $Ax = 0$ has only the zero solution, and $b = \begin{pmatrix} 1 \\ 3 \\ 2 \\ 0 \end{pmatrix}$, then the system $Ax = b$

Select one:

a. is either inconsistent or has an infinite number of solutions

b. is inconsistent

c. is either inconsistent or has one solution

d. has exactly one solution ✖

The correct answer is: is either inconsistent or has one solution

Question **19**

Correct

Mark 1.00 out of 1.00

If x_0 is a solution of the nonhomogeneous system $Ax = b$ and x_1 is a solution of the homogeneous system $Ax = 0$. Then $x_1 + x_0$ is a solution of

Select one:

a. the system $Ax = 0$

b. the system $Ax = 2b$

c. the system $Ax = Ab$

d. the system $Ax = b$ ✔

The correct answer is: the system $Ax = b$

Question **20**

Correct

Mark 1.00 out of 1.00

If A, B are two square nonzero matrices and $AB = 0$ then both A and B are singular

Select one:

a. False

b. True ✔

The correct answer is: True

Question 21

Incorrect

Mark 0.00 out of 1.00

If A is a 3×3 matrix with $\det(A) = -1$. Then $\det(adj(A)) =$

Select one:

a. -1.

b. 3.

c. -3.

d. 1.

The correct answer is: 1.

Question 22

Correct

Mark 1.00 out of 1.00

If A is a 3×5 matrix, then the system $Ax = 0$

Select one:

a. has no solution.

b. has only the zero solution

c. has infinitely many solutions

d. is inconsistent

The correct answer is: has infinitely many solutions

Question 23

Correct

Mark 1.00 out of 1.00

If A is a nonsingular $n \times n$ matrix, $b \in \mathbb{R}^n$, then

Select one:

a. The system $Ax = b$ is inconsistent

b. The system $Ax = b$ has infinitely many solutions

c. The system $Ax = b$ has only two solutions

d. The system $Ax = b$ has a unique solution

The correct answer is: The system $Ax = b$ has a unique solution

Question 24

Correct

Mark 1.00 out of 1.00

If A, B are $n \times n$ symmetric matrices then AB is symmetric.

Select one:

a. False

b. True

The correct answer is: False

Question **25**

Correct

Mark 1.00 out of 1.00

If A is a 2×3-matrix, and $b = a_2$ (second column of A), then a solution to the system $Ax = b$ is

Select one:

a. $x = \begin{pmatrix} 1 \\ 0 \\ 0 \\ 0 \end{pmatrix}$

b. $x = \begin{pmatrix} 1 \\ 0 \\ 0 \end{pmatrix}$

c. $x = \begin{pmatrix} 0 \\ 1 \\ 0 \end{pmatrix}$ ✔

d. $x = \begin{pmatrix} 0 \\ 1 \\ 0 \\ 0 \end{pmatrix}$

The correct answer is: $x = \begin{pmatrix} 0 \\ 1 \\ 0 \end{pmatrix}$

Question **26**

Incorrect

Mark 0.00 out of 1.00

If A and B are $n \times n$ matrices such that $Ax \neq Bx$ for all nonzero $x \in \mathbb{R}^n$. Then

Select one:

a. $A - B$ is nonsingular.

b. A and B are nonsingular. ✘

c. $A - B$ is singular.

d. A and B are singular.

The correct answer is: $A - B$ is nonsingular.

Question **27**

Correct

Mark 1.00 out of 1.00

If A is a nonsingular $n \times n$ matrix, then

Select one:

a. There are elementary matrices $E_1, E_2, \cdots, E_k$ such that $A = E_1 E_2 \cdots E_k$. ✔

b. There is a singular matrix C such that $A = CI$.

c. The system $Ax = 0$ has a nontrivial (nonzero) solution.

d. $\det(A) = 1$

The correct answer is: There are elementary matrices $E_1, E_2, \cdots, E_k$ such that $A = E_1 E_2 \cdots E_k$.

Question 28

Correct

Mark 1.00 out of 1.00

Any elementary matrix is nonsingular

Select one:

a. False

b. True

The correct answer is: True

Question 29

Correct

Mark 1.00 out of 1.00

If A is singular and B is nonsingular $n \times n$-matrices, then AB is

Select one:

a. singular

b. may or may not be singular

c. nonsingular

The correct answer is: singular

Question 30

Correct

Mark 1.00 out of 1.00

In the $n \times n$-linear system $Ax = b$, if A is singular and b is a linear combination of the columns of A then the system has

Select one:

a. exactly two solutions

b. no solution

c. a unique solution

d. infinitely many solutions

The correct answer is: infinitely many solutions

Started on	Tuesday, 24 November 2020, 4:00 PM
State	Finished
Completed on	Tuesday, 24 November 2020, 5:07 PM
Time taken	1 hour 7 mins
Grade	**24.00** out of 30.00 (**80**%)

Question **1**
Correct
Mark 1.00 out of 1.00

If A, B, C are 3×3-matrices, $\det(A) = 9, \det(B) = 2, \det(C) = 3$, then $\det(3C^T BA^{-1}) =$

Select one:
- a. 6
- b. 16
- c. 18 ✔
- d. 2

The correct answer is: 18

Question **2**
Correct
Mark 1.00 out of 1.00

Let $A = \begin{pmatrix} 1 & -1 & 1 \\ 3 & -2 & 2 \\ -2 & -2 & 3 \end{pmatrix}$, then $\det(A) =$

Select one:
- a. 1 ✔
- b. 9
- c. 7
- d. 0

The correct answer is: 1

Question **3**
Correct
Mark 1.00 out of 1.00

The adjoint of the matrix $\begin{pmatrix} 4 & 1 \\ 2 & -1 \end{pmatrix}$ is

Select one:
- a. $\begin{pmatrix} -1 & -1 \\ -2 & 4 \end{pmatrix}$ ✔
- b. $\begin{pmatrix} -1 & -2 \\ -3 & -5 \end{pmatrix}$
- c. $\begin{pmatrix} 4 & -1 \\ -2 & -1 \end{pmatrix}$
- d. $\begin{pmatrix} -1 & 2 \\ 1 & -4 \end{pmatrix}$

The correct answer is: $\begin{pmatrix} -1 & -1 \\ -2 & 4 \end{pmatrix}$

Question **4**

Correct

Mark 1.00 out of 1.00

If $A = \begin{pmatrix} 1 & 4 & -1 \\ 2 & 9 & 2 \\ -3 & -12 & 3 \end{pmatrix}$ then the lower triangular matrix L in the LU-facrorization of A is given by

Select one:

a. $L = \begin{pmatrix} 1 & 0 & 0 \\ 2 & 1 & 0 \\ -3 & 0 & 1 \end{pmatrix}$ ✔

b. $L = \begin{pmatrix} 1 & 0 & 0 \\ 2 & 1 & 0 \\ -3 & 0 & 0 \end{pmatrix}$

c. $L = \begin{pmatrix} 1 & 0 & 0 \\ -2 & 1 & 0 \\ 3 & 0 & 1 \end{pmatrix}$

d. $L = \begin{pmatrix} 1 & 0 & 0 \\ -2 & 1 & 0 \\ 3 & 0 & 0 \end{pmatrix}$

The correct answer is: $L = \begin{pmatrix} 1 & 0 & 0 \\ 2 & 1 & 0 \\ -3 & 0 & 1 \end{pmatrix}$

Question **5**

Correct

Mark 1.00 out of 1.00

Any two $n \times n$-singular matrices are row equivalent.

Select one:

a. True

b. False ✔

The correct answer is: False

Question **6**

Correct

Mark 1.00 out of 1.00

If A is a nonsingular and symmetric matrix, then

Select one:

a. A^{-1} is singular and symmetric

b. A^{-1} is singular and not symmetric

c. A^{-1} is nonsingular and symmetric ✔

d. A^{-1} is nonsingular and not symmetric

The correct answer is: A^{-1} is nonsingular and symmetric

Question 7
Correct
Mark 1.00 out of 1.00

If $AB = AC$, and $|A| \neq 0$, then

Select one:
- a. $B \neq C$
- b. $A = 0$
- c. $A = C$
- d. $B = C$.

The correct answer is: $B = C$.

Question 8
Incorrect
Mark 0.00 out of 1.00

If A, B are $n \times n$ symmetric matrices then AB is symmetric.

Select one:
- a. False
- b. True

The correct answer is: False

Question 9
Correct
Mark 1.00 out of 1.00

If y, z are solutions to $Ax = b$, then $y + z$ is a solution of the system $Ax = 0$.

Select one:
- a. False
- b. True

The correct answer is: False

Question 10
Correct
Mark 1.00 out of 1.00

Let $A = \begin{pmatrix} 1 & 1 & 0 \\ 1 & a & 1 \\ 1 & 1 & 2 \end{pmatrix}$. the value(s) of a that make A nonsingular

Select one:
- a. $a \neq \frac{1}{2}$
- b. $a = 1$
- c. $a = \frac{1}{2}$
- d. $a \neq 1$

The correct answer is: $a \neq 1$

Question 11
Incorrect
Mark 0.00 out of 1.00

If A, B are $n \times n$-skew-symmetric matrices(A is skew symmetric if $A^T = -A$), then $AB + BA$ is symmetric

Select one:
- a. True
- b. False

The correct answer is: True

Question **12**

Correct

Mark 1.00 out of 1.00

If A is a singular matrix, then A^T is also singular.

Select one:

a. True ✔

b. False

The correct answer is: True

Question **13**

Correct

Mark 1.00 out of 1.00

If A is a 4×3-matrix, $b \in \mathbb{R}^4$, and the system $Ax = b$ is consistent, then $Ax = b$ has a unique solution.

Select one:

a. True

b. False ✔

The correct answer is: False

Question **14**

Correct

Mark 1.00 out of 1.00

If A is a 4×4-matrix and $x = \begin{pmatrix} 2 \\ 3 \\ 0 \\ 1 \end{pmatrix}$ is a solution to the system $Ax = 0$, then A is singular.

Select one:

a. False

b. True ✔

The correct answer is: True

Question **15**

Correct

Mark 1.00 out of 1.00

If A and B are $n \times n$ matrices such that $Ax \neq Bx$ for all nonzero $x \in \mathbb{R}^n$. Then

Select one:

a. $A - B$ is singular.

b. A and B are nonsingular.

c. $A - B$ is nonsingular. ✔

d. A and B are singular.

The correct answer is: $A - B$ is nonsingular.

Question **16**

Correct

Mark 1.00 out of 1.00

If $A = \begin{pmatrix} 1 & -2 & 5 \\ 4 & -11 & 8 \\ -3 & 3 & -27 \end{pmatrix}$ and $b = \begin{pmatrix} b_1 \\ b_2 \\ b_3 \end{pmatrix}$, then the system $Ax = b$ is consistent if and only if

Select one:

- a. $7b_1 - b_2 + b_3 \neq 1$
- b. $7b_1 - b_2 + b_3 \neq 0$
- c. $7b_1 - b_2 + b_3 = 1$
- d. $7b_1 - b_2 + b_3 = 0$ ✔

The correct answer is: $7b_1 - b_2 + b_3 = 0$

Question **17**

Correct

Mark 1.00 out of 1.00

Any two $n \times n$-nonsingular matrices are row equivalent.

Select one:

- a. False
- b. True ✔

The correct answer is: True

Question **18**

Correct

Mark 1.00 out of 1.00

A square matrix A is nonsingular iff its RREF (reduced row echelon form) is the identity matrix.

Select one:

- a. True ✔
- b. False

The correct answer is: True

Question **19**

Correct

Mark 1.00 out of 1.00

If the row echelon form of $(A|b)$ is $\begin{pmatrix} 1 & 0 & -2 & -1 & | & -2 \\ 0 & 1 & 1 & -1 & | & -1 \\ 0 & 0 & 1 & 1 & | & 0 \end{pmatrix}$ then the general form of the solutions is given by

Select one:

a. $x = \begin{pmatrix} -2-\alpha \\ 1-\alpha \\ \alpha \\ \alpha \end{pmatrix}$

b. $x = \begin{pmatrix} -2-\alpha \\ -1+2\alpha \\ -\alpha \\ \alpha \end{pmatrix}$ ✔

c. $x = \begin{pmatrix} \alpha \\ 2-\alpha \\ \alpha \\ \alpha \end{pmatrix}$

d. $x = \begin{pmatrix} -2-\alpha \\ 1-\alpha \\ \alpha \\ 1 \end{pmatrix}$

The correct answer is: $x = \begin{pmatrix} -2-\alpha \\ -1+2\alpha \\ -\alpha \\ \alpha \end{pmatrix}$

Question **20**

Incorrect

Mark 0.00 out of 1.00

If A is a 3×3 matrix with $\det(A) = -1$. Then $\det(adj(A)) =$

Select one:

a. 3. ✘

b. 1.

c. -1.

d. -3.

The correct answer is: 1.

Question **21**

Correct

Mark 1.00 out of 1.00

If A is a 3×3 matrix such that $det(A) = 2$, then $\det(3A) = 6$

Select one:

a. True

b. False ✔

The correct answer is: False

Question **22**

Correct

Mark 1.00 out of 1.00

If A is a 3×5 matrix, then the system $Ax = 0$

Select one:

a. is inconsistent

b. has infinitely many solutions ✔

c. has no solution.

d. has only the zero solution

The correct answer is: has infinitely many solutions

Question **23**

Correct

Mark 1.00 out of 1.00

Let U be an $n \times n$-matrix in reduced row echelon form and $U \neq I$, then

Select one:

a. $\det(U) = 1$

b. The system $Ux = 0$ has only the zero solution.

c. U is the zero matrix

d. The system $Ux = 0$ has infinitely many solutions ✔

The correct answer is: The system $Ux = 0$ has infinitely many solutions

Question **24**

Incorrect

Mark 0.00 out of 1.00

Let A be a 3×3-matrix with $a_1 = a_2$. If $b = a_2 - a_3$, where a_1, a_2, a_3 ar the columns of A, then a solution to the system $Ax = b$ is

Select one:

a. $x = \begin{pmatrix} 1 \\ 0 \\ -1 \end{pmatrix}$

b. $x = \begin{pmatrix} 1 \\ 1 \\ -1 \end{pmatrix}$ ✖

c. $x = \begin{pmatrix} 1 \\ 1 \\ 0 \end{pmatrix}$

d. $x = \begin{pmatrix} 0 \\ 0 \\ 2 \end{pmatrix}$

The correct answer is: $x = \begin{pmatrix} 1 \\ 0 \\ -1 \end{pmatrix}$

Question 25

Correct

Mark 1.00 out of 1.00

If A is an $n \times n$ matrix and the system $Ax = b$ has infinitely many solutions, then

Select one:

a. A is nonsingular

b. A has a row of zeros

c. A is symmetric

d. A singular ✔

The correct answer is: A singular

Question 26

Correct

Mark 1.00 out of 1.00

Let A be a 4×4-matrix such that $A \begin{bmatrix} 1 \\ 2 \\ 3 \\ 4 \end{bmatrix} = \begin{bmatrix} 0 \\ 0 \\ 0 \\ 0 \end{bmatrix}$, then

Select one:

a. A is the zero matrix

b. A is singular. ✔

c. The system $Ax = 0$ has only one solution

d. There are elementary matrices $E_1, E_2, \cdots, E_k$ such that $A = E_1 E_2 \cdots E_k$

The correct answer is: A is singular.

Question 27

Incorrect

Mark 0.00 out of 1.00

If B is a 3×3 nonsingular matrix such that $B^3 = B$, then one of the following is always true

Select one:

a. $B^4 = B$.

b. det$(B) = 1$. ✖

c. $B = 0$.

d. $B = B^{-1}$.

The correct answer is: $B = B^{-1}$.

Question 28

Incorrect

Mark 0.00 out of 1.00

If A is a singular $n \times n$-matrix, $b \in \mathbb{R}^n$, then the system $Ax = b$

Select one:

a. is inconsistent

b. has a unique solution ✖

c. has infinitely many solutions.

d. has either no solution or an infinite number of solutions

The correct answer is: has either no solution or an infinite number of solutions

Question **29**

Correct

Mark 1.00 out of 1.00

Let $A = \begin{pmatrix} 1 & 2 & 3 & 0 \\ 1 & 1 & 2 & 1 \\ 2 & 3 & 5 & 1 \end{pmatrix}$ and $b = \begin{pmatrix} 2 \\ 1 \\ 4 \end{pmatrix}$. The system $Ax = b$

Select one:

- a. has exactly three solutions.
- b. has a unique solution
- c. is inconsistent ✔
- d. has infinitely many solutions

The correct answer is: is inconsistent

Question **30**

Correct

Mark 1.00 out of 1.00

Let $(1, 2, 0)^T$ and $(2, 1, 1)^T$ be the first two columns of a 3×3 matrix A and $(1, 1, 1)^T$ be a solution of the system $Ax = (2, 1, -1)^T$. Then the third column of the matrix A is

Select one:

- a. $(1, 2, 2)^T$.
- b. $(-1, -2, -2)^T$. ✔
- c. $(4, -1, 1)^T$.
- d. $(1, 1, 0)^T$.

The correct answer is: $(-1, -2, -2)^T$.

Started on	Monday, 19 October 2020, 10:01 AM
State	Finished
Completed on	Monday, 19 October 2020, 10:31 AM
Time taken	30 mins 1 sec
Marks	23.00/25.00
Grade	**9.20** out of 10.00 (**92**%)

Question **1**
Correct
Mark 2.00 out of 2.00

If a matrix A is row equivalent to I, then A is nonsingular.

Select one:

- a. True ✔
- b. False

Question **2**
Correct
Mark 2.00 out of 2.00

If a matrix A is nonsingular, then the matrix A^T is also nonsingular.

Select one:

- a. True ✔
- b. False

Question **3**
Correct
Mark 2.00 out of 2.00

If A and B are $n \times n$ nonsingular matrices, then AB is also nonsingular.

Select one:

- a. True ✔
- b. False

Question **4**
Correct
Mark 2.00 out of 2.00

If $Ax = b$ is an overdetermined and consistent linear system, then it must have infinitely many solutions.

Select one:

- a. True
- b. False ✔

Question **5**
Correct
Mark 2.00 out of 2.00

Let A be a 3×3 matrix and suppose that $A \begin{bmatrix} 1 \\ 0 \\ 0 \end{bmatrix} = \begin{bmatrix} 0 \\ 0 \\ 0 \end{bmatrix}$. Then

Select one:

- a. $Ax = 0 <$ has infinitely many solutions ✔
- b. $Ax = (1, 0, 0)^T$ has infinitely many solutions
- c. A is nonsingular
- d. None of the above

Question **6**
Correct
Mark 2.00 out of 2.00

If a matrix is in row echelon form, then it is also in reduced row echelon form.

Select one:

- a. True
- b. False ✔

b. False

Question **7**

Correct

Mark 3.00 out of 3.00

If $(A|b) = \left[\begin{array}{ccc|c} 1 & 0 & 2 & 1 \\ -1 & 1 & -1 & 0 \\ -1 & 0 & \alpha & \beta \end{array}\right]$ is the augmented matrix of the system $Ax = b$. Answer the following questions.

The system has no solution if

- $\alpha = -2$ and $\beta \neq -1$
- $\alpha = -2$ and $\beta = -1$
- $\alpha \neq -2$ and $\beta \neq -1$
- $\alpha \neq -2$ and $\beta = -1$

The system has exactly one solution if

- $\alpha = -2$ and $\beta = -1$
- $\alpha \neq -2$
- $\alpha = -2$
- $\alpha \neq -2$ and $\beta \neq -1$

The system has infinitely many solutions if

- $\alpha \neq -2$ and $\beta \neq -1$
- $\alpha = -2$ and $\beta \neq -1$
- $\alpha = -2$ and $\beta = -1$
- $\alpha \neq -2$ and $\beta = -1$

Question **8**

Correct

Mark 2.00 out of 2.00

Let $A = \begin{bmatrix} 1 & 2 & 1 \\ -1 & 1 & 0 \\ 1 & 8 & 1 \end{bmatrix}$. If we want to find the LU factorization of A, then $L =$

Select one:

a. $\begin{bmatrix} 1 & 0 & 0 \\ -1 & 1 & 0 \\ 1 & 2 & 1 \end{bmatrix}$

b. $\begin{bmatrix} 1 & 0 & 0 \\ -1 & 1 & 0 \\ 1 & 8 & 1 \end{bmatrix}$

c. $\begin{bmatrix} 1 & 0 & 0 \\ 1 & 1 & 0 \\ -1 & -2 & 1 \end{bmatrix}$

d. $\begin{bmatrix} 1 & 0 & 0 \\ 1 & 1 & 0 \\ -1 & -8 & 1 \end{bmatrix}$

Question **9**

Incorrect

Mark 0.00 out of 2.00

A homogeneous system can have a nontrivial solution.

Select one:

a. True

b. False

Question **10**

Correct

Mark 2.00 out of 2.00

The inverse of an elementary matrix is also an elementary matrix.

Select one:

a. True

b. False

Question **11**

Correct

Mark 2.00 out of 2.00

If a system of linear equations is undetermined, then it must have infinitely many solutions.

Select one:

- a. True
- b. False ✔

Question **12**

Correct

Mark 2.00 out of 2.00

The sum of two $n \times n$ nonsingular matrices is also nonsingular.

Select one:

- a. True
- b. False ✔

Started on	Monday, 19 October 2020, 5:39 PM
State	Finished
Completed on	Monday, 19 October 2020, 5:57 PM
Time taken	18 mins 13 secs
Grade	**10** out of 10 (**100**%)

Question **1**
Correct
Mark 1 out of 1

If $AB = 0$, where A and B are $n \times n$ matrices. Then

Select one:

a. either A or B is singular ✔

b. either $A = 0$ or $B = 0$

c. both A, B are singular.

d. both A, B are nonsingular.

The correct answer is: either A or B is singular

Question **2**
Correct
Mark 1 out of 1

If A, B, C are $n \times n$-matrices with $AB = AC$, then $B = C$

Select one:

a. False ✔

b. True

The correct answer is: False

Question **3**
Correct
Mark 1 out of 1

The sum of two elementary matrices is elementary

Select one:

a. False ✔

b. True

The correct answer is: False

Question **4**
Correct
Mark 1 out of 1

If A, B are $n \times n$-symmetric matrices, then $AB - BA$ is skew symmetric

Select one:

a. False

b. True ✔

The correct answer is: True

Question **5**
Correct
Mark 1 out of 1

In the square linear system $Ax = b$, if A is singular and b is a linear combination of the columns of A then the system has

Select one:
- a. no solution
- b. infinitely many solutions ✔
- c. a unique solution
- d. can not tell

The correct answer is: infinitely many solutions

Question **6**
Correct
Mark 1 out of 1

If A is a 3×3-matrix and the system $Ax = \begin{pmatrix} 5 \\ 1 \\ 3 \end{pmatrix}$ has a unique solution, then the system $Ax = \begin{pmatrix} 0 \\ 0 \\ 0 \end{pmatrix}$

Select one:
- a. has infinitely many solutions
- b. none of the above
- c. is inconsistent
- d. has only the zero solution. ✔

The correct answer is: has only the zero solution.

Question **7**
Correct
Mark 1 out of 1

If $(A|b) = \begin{pmatrix} 1 & 2 & 1 & -1 & | & 0 \\ 2 & 3 & 1 & 1 & | & -1 \\ 0 & 1 & 1 & \alpha & | & \beta \end{pmatrix}$, then the system is inconsistent if

Select one:
- a. $\alpha = -3$ and $\beta = 1$
- b. $\alpha \neq -3$ and $\beta \neq 1$
- c. $\alpha = -3$ and $\beta \neq 1$ ✔
- d. $\alpha \neq -3$ and β any number

The correct answer is: $\alpha = -3$ and $\beta \neq 1$

Question **8**
Correct
Mark 1 out of 1

If y, z are solutions to $Ax = b$, then $y - z$ is a solution of the system $Ax = 0$.

Select one:
- a. True ✔
- b. False

The correct answer is: True

Question 9
Correct
Mark 1 out of 1

If A is a 3×4-matrix, and $b = a_2$ (second column of A), then a solution to the system $Ax = b$ is

Select one:

a. $x = \begin{pmatrix} 0 \\ 1 \\ 0 \\ 0 \end{pmatrix}$ ✔

b. $x = \begin{pmatrix} 1 \\ 0 \\ 0 \end{pmatrix}$

c. $x = \begin{pmatrix} 1 \\ 0 \\ 0 \\ 0 \end{pmatrix}$

d. $x = \begin{pmatrix} 0 \\ 1 \\ 0 \end{pmatrix}$

The correct answer is: $x = \begin{pmatrix} 0 \\ 1 \\ 0 \\ 0 \end{pmatrix}$

Question 10
Correct
Mark 1 out of 1

If B is a 3×3 matrix such that $B^2 = B$. One of the following is always true

Select one:

a. $B^5 = B$. ✔

b. $B = 0$.

c. $B = I$.

d. B is nonsingular.

The correct answer is: $B^5 = B$.

Started on	Sunday, 10 January 2021, 9:57 AM
State	Finished
Completed on	Sunday, 10 January 2021, 10:58 AM
Time taken	1 hour 1 min
Grade	**29.00** out of 32.00 (**91**%)

Question **1**
Incorrect
Mark 0.00 out of 1.00

Every spanning set for $\mathbb{R}^3$ contains at least 3 vectors.

Select one:

- a. False ✖
- b. True

The correct answer is: True

Question **2**
Correct
Mark 1.00 out of 1.00

Let $S = \{\begin{pmatrix} x \\ y \end{pmatrix} \in \mathbb{R}^2 : x = \frac{1}{y}\}$, then S is a subspace of $\mathbb{R}^2$.

Select one:

- a. True
- b. False ✔

The correct answer is: False

Question **3**
Correct
Mark 1.00 out of 1.00

Let $E = [2 + x, 3 - x]$, $F = [1, x]$ be ordered bases for P_2. The transition matrix from E to F is

Select one:

- a. $\begin{pmatrix} 2 & 3 \\ 1 & -1 \end{pmatrix}$ ✔
- b. $\begin{pmatrix} 2 & 1 \\ 3 & -1 \end{pmatrix}$
- c. $\begin{pmatrix} 1 & -1 \\ 2 & 3 \end{pmatrix}$
- d. $\begin{pmatrix} 1 & -1 \\ 3 & 2 \end{pmatrix}$

The correct answer is: $\begin{pmatrix} 2 & 3 \\ 1 & -1 \end{pmatrix}$

Question **4**

Correct

Mark 1.00 out of 1.00

Let $E = [2+x, 1-x, x^2+1]$ be an ordered basis for P_3. If $[p(x)]_E = \begin{pmatrix} 1 \\ -1 \\ 3 \end{pmatrix}$, then

Select one:

- a. $p(x) = 3x^2 + x - 3$
- b. $p(x) = 3x^2 + 2x + 4$ ✔
- c. $p(x) = x^2 - x + 3$
- d. $p(x) = 3x^2 + 2x + 5$

The correct answer is: $p(x) = 3x^2 + 2x + 4$

Question **5**

Correct

Mark 1.00 out of 1.00

If A is a 3×3-matrix, and $Ax = 0$ has only the zero solution, then nullity$(A) =$

Select one:

- a. 1
- b. 2
- c. 0 ✔
- d. 3

The correct answer is: 0

Question **6**

Correct

Mark 1.00 out of 1.00

Let $S = \{ \begin{pmatrix} a+b+2c \\ a+2c \\ a+b+2c \end{pmatrix} : a, b \in \mathbb{R} \}$. Then dimension of S equals

Select one:

- a. 0
- b. 1
- c. 3
- d. 2 ✔

The correct answer is: 2

Question **7**

Incorrect

Mark 0.00 out of 1.00

Which of the following **is not a basis** for the corresponding space

Select one:

- a. $\{(1,1)^T, (2,-3)^T\}; \mathbb{R}^2$
- b. $\{5-x, x-1\}; P_2$
- c. $\{x+4, 1-x^2, x^2+x+3\}; P_3$ ✘
- d. $\{(-2,-1,-1)^T, (-3,-3,0)^T, (2,0,2)^T\}; \mathbb{R}^3$

The correct answer is: $\{(-2,-1,-1)^T, (-3,-3,0)^T, (2,0,2)^T\}; \mathbb{R}^3$

Question **8**

Correct

Mark 1.00 out of 1.00

If V is a vector space of dimension n, then any subset from V that has less than n vectors is not a spanning set for V.

Select one:

- a. True ✔
- b. False

The correct answer is: True

Question **9**

Correct

Mark 1.00 out of 1.00

The vectors $\{x^2 + 2x + 1, x - 1, x^2 + x + 1\}$ form a basis for P_3.

Select one:

- a. True ✔
- b. False

The correct answer is: True

Question **10**

Correct

Mark 1.00 out of 1.00

If A is an $n \times n$-matrix and for each $b \in \mathbb{R}^n$ the system $Ax = b$ has a unique solution, then

Select one:

- a. A is nonsingular ✔
- b. nullity$(A) = 1$
- c. rank$(A) = n - 1$
- d. A is singular

The correct answer is: A is nonsingular

Question **11**

Correct

Mark 1.00 out of 1.00

The coordinate vector of $\begin{pmatrix} -3 \\ -2 \\ -5 \end{pmatrix}$ with respect to the ordered basis $[\begin{pmatrix} 1 \\ 1 \\ 1 \end{pmatrix}, \begin{pmatrix} 1 \\ 2 \\ 2 \end{pmatrix}, \begin{pmatrix} 2 \\ 3 \\ 4 \end{pmatrix}]$ is

Select one:

- a. $\begin{pmatrix} 1 \\ 2 \\ 3 \end{pmatrix}$
- b. $\begin{pmatrix} -1 \\ 4 \\ -3 \end{pmatrix}$ ✔
- c. $\begin{pmatrix} 1 \\ -4 \\ 3 \end{pmatrix}$
- d. $\begin{pmatrix} 3 \\ 2 \\ 5 \end{pmatrix}$

The correct answer is: $\begin{pmatrix} -1 \\ 4 \\ -3 \end{pmatrix}$

Question **12**

Correct

Mark 1.00 out of 1.00

If A is a 3×5-matrix, rows of A are linearly independent, then

Select one:

a. rank(A) = nullity$(A) + 2$

b. rank(A) = nullity(A)

c. rank(A) = nullity$(A) + 1$ ✔

d. rank(A) = nullity$(A) + 3$

The correct answer is: rank(A) = nullity$(A) + 1$

Question **13**

Correct

Mark 1.00 out of 1.00

If A is a 4×6 matrix, then nullity of $A \geq 2$.

Select one:

a. True ✔

b. False

The correct answer is: True

Question **14**

Correct

Mark 1.00 out of 1.00

If A is a 3×3-matrix, and $Ax = 0$ has only the zero solution, then rank$(A) =$

Select one:

a. 3 ✔

b. 1

c. 2

d. 0

The correct answer is: 3

Question **15**

Correct

Mark 1.00 out of 1.00

Let V be a vector space of dimension 4 and $W = \{v_1, v_2, v_3, v_4, v_5\}$ a set of nonzero vectors of V, then

Select one:

a. W is a basis

b. W is a spanning set

c. W is linearly independent

d. W is linearly dependent ✔

The correct answer is: W is linearly dependent

Question **16**

Incorrect

Mark 0.00 out of 1.00

Let $S = \{f \in C[-1,1] : f(-1) = f(1)\}$, then S is a subspace of $C[-1,1]$.

Select one:

a. True

b. False ✖

The correct answer is: True

The correct answer is: True

Question **17**
Correct
Mark 1.00 out of 1.00

If A is an $m \times n$-matrix, $m \neq n$, then either the rows or the columns of A are linearly independent

Select one:
- a. False
- b. True

The correct answer is: False

Question **18**
Correct
Mark 1.00 out of 1.00

If $f_1, f_2, \cdots, f_n \in C^{n-1}[a, b]$ and $W[f_1, f_2, \cdots, f_n](x_0) \neq 0$ for some $x_0 \in [a, b]$, then $f_1, f_2, \cdots, f_n$ are

Select one:
- a. linearly independent.
- b. linearly dependent
- c. form a spanning set for $C^{n-1}[a, b]$

The correct answer is: linearly independent.

Question **19**
Correct
Mark 1.00 out of 1.00

let A be a 4×7-matrix, if the row echelon form of A has 2 nonzero rows, then dim(column space of A) is

Select one:
- a. 3
- b. 5
- c. 2
- d. 7

The correct answer is: 2

Question **20**
Correct
Mark 1.00 out of 1.00

Let $E = [2 + x, 1 - x, x^2 + 1]$ be an ordered basis for P_3. If $p(x) = -3x^2 + x + 5$, then the coordinate vector of $p(x)$ with respect to E is

Select one:
- a. $\begin{pmatrix} 2 \\ -3 \\ 3 \end{pmatrix}$
- b. $\begin{pmatrix} 3 \\ 2 \\ -3 \end{pmatrix}$
- c. $\begin{pmatrix} 3 \\ 5 \\ 4 \end{pmatrix}$
- d. $\begin{pmatrix} 3 \\ -3 \\ 2 \end{pmatrix}$

The correct answer is: $\begin{pmatrix} 3 \\ 2 \\ -3 \end{pmatrix}$

Question 21

Correct

Mark 1.00 out of 1.00

The functions $\sin x, \cos x, \sin(2x)$ in $C^2[0, 2\pi]$ are

Select one:

- a. linearly dependent
- b. linearly independent ✓

The correct answer is: linearly independent

Question 22

Correct

Mark 1.00 out of 1.00

If $A = \begin{pmatrix} 1 & -2 & 1 & 0 \\ -1 & 2 & 2 & 0 \\ 2 & -4 & 0 & 0 \end{pmatrix}$, then $\text{rank}(A) = 3$.

Select one:

- a. False ✓
- b. True

The correct answer is: False

Question 23

Correct

Mark 1.00 out of 1.00

The transition matrix from the standard basis $S = \left[e_1 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}, e_2 = \begin{pmatrix} 0 \\ 1 \end{pmatrix}\right]$ to the ordered basis $U = \left[u_1 = \begin{pmatrix} 1 \\ 2 \end{pmatrix}, u_2 = \begin{pmatrix} 3 \\ 7 \end{pmatrix}\right]$ is

Select one:

- a. $T = \begin{pmatrix} 1 & -3 \\ -2 & 7 \end{pmatrix}$
- b. $T = \begin{pmatrix} -7 & 3 \\ 2 & -1 \end{pmatrix}$
- c. $T = \begin{pmatrix} 7 & -3 \\ -2 & 1 \end{pmatrix}$ ✓
- d. $T = \begin{pmatrix} 1 & 3 \\ 2 & 7 \end{pmatrix}$

The correct answer is: $T = \begin{pmatrix} 7 & -3 \\ -2 & 1 \end{pmatrix}$

Question 24

Correct

Mark 1.00 out of 1.00

Let V be a vector space, $\{v_1, v_2, \ldots v_n\}$ a spanning set for V, and $v \in V$, then the vectors $\{v_1, v_2, \ldots v_n, v\}$ form a spanning set for V.

Select one:

- a. False
- b. True ✓

The correct answer is: True

Question **25**

Correct

Mark 1.00 out of 1.00

The nullity of $A = \begin{pmatrix} 1 & 4 & 1 & 2 & 1 \\ 2 & 6 & -1 & 2 & -1 \\ 2 & 10 & 0 & 4 & 0 \end{pmatrix}$ is

Select one:

- a. 3
- b. 0
- c. 1
- d. 2 ✔

The correct answer is: 2

Question **26**

Correct

Mark 1.00 out of 1.00

The vectors $\{(1,-1,1)^T, (1,-1,2)^T, (1,-1,2)^T\}$ form a basis for $\mathbb{R}^3$.

Select one:

- a. False ✔
- b. True

The correct answer is: False

Question **27**

Correct

Mark 1.00 out of 1.00

The coordinate vector of $8+6x$ with respect to the basis $[2x, 2]$ is $(4,3)^T$

Select one:

- a. False ✔
- b. True

The correct answer is: False

Question **28**

Correct

Mark 1.00 out of 1.00

Let A be a 5×4 matrix, and rank$(A) = 4$

Select one:

- a. A has a row of zeros
- b. The columns of A are linearly independent ✔
- c. nullity$(A) = 1$
- d. The rows of A are linearly independent

The correct answer is: The columns of A are linearly independent

Question **29**

Correct

Mark 1.00 out of 1.00

Let A be a 4×3 matrix, and nullity$(A) = 0$, then

Select one:

- a. The rows of A are linearly independent
- b. The columns of A are linearly independent ✔
- c. rank$(A) = 1$
- d. the columns of A form a basis for $\mathbb{R}^4$

The correct answer is: The columns of A are linearly independent

Question **30**

Correct

Mark 1.00 out of 1.00

dimension of the subspace $S = \text{Span}\left\{A_1 = \begin{pmatrix} 1 & 2 \\ 1 & 0 \end{pmatrix}, A_2 \begin{pmatrix} 0 & -1 \\ 1 & 3 \end{pmatrix}, A_3 = \begin{pmatrix} -3 & -8 \\ -1 & 6 \end{pmatrix}\right\}$ is

Select one:

- a. 1
- b. 2 ✔
- c. 0
- d. 3

The correct answer is: 2

Question **31**

Correct

Mark 1.00 out of 1.00

If the columns of $A_{n \times n}$ are linearly independent and $b \in \mathbb{R}^n$, then the system $Ax = b$ is inconsistent.

Select one:

- a. False ✔
- b. True

The correct answer is: False

Question **32**

Correct

Mark 1.00 out of 1.00

If $v_1, v_2, \cdots, v_k$ are vectors in a vector space V, and Span$(v_1, v_2, \cdots, v_k) =$ Span$(v_1, v_2, \cdots, v_{k-1})$, then v_k can be written as alinear combination of $v_1, v_2, \cdots, v_{k-1}$

Select one:

- a. True ✔
- b. False

The correct answer is: True

Jump to...

Announcements →

Started on	Sunday, 10 January 2021, 9:55 AM
State	Finished
Completed on	Sunday, 10 January 2021, 11:10 AM
Time taken	1 hour 15 mins
Grade	**23.00** out of 32.00 (**72**%)

Question **1**
Correct
Mark 1.00 out of 1.00

Let V be a vector space, $\{v_1, v_2, \ldots v_n\}$ a spanning set for V, and $v \in V$, then the vectors $\{v_1, v_2, \ldots v_n, v\}$ form a spanning set for V.

Select one:

a. False

b. True ✔

The correct answer is: True

Question **2**
Correct
Mark 1.00 out of 1.00

If $\{v_1, v_2, v_3, v_4\}$ forms a spanning set for a vector space V, dim$(V) = 3$, v_4 can be written as a linear combination of v_1, v_2, v_3, then

Select one:

a. $\{v_1, v_2, v_3\}$ do not form a spanning set for V

b. $\{v_1, v_2, v_3\}$ is a basis for V ✔

c. $\{v_1, v_2, v_3\}$ are linearly dependent

d. v_1 can be written as a linear combination of v_2, v_3, v_4

The correct answer is: $\{v_1, v_2, v_3\}$ is a basis for V

Question **3**
Correct
Mark 1.00 out of 1.00

The nullity of $A = \begin{pmatrix} 1 & 1 & 0 & 2 & 0 \\ 1 & 2 & -1 & 0 & 1 \\ 2 & 3 & -1 & 2 & 1 \end{pmatrix}$ is

Select one:

a. 4

b. 3 ✔

c. 2

d. 1

The correct answer is: 3

Question **4**

Correct

Mark 1.00 out of 1.00

Let $E = [2 + x, 1 - x, x^2 + 1]$ be an ordered basis for P_3. If $[p(x)]_E = \begin{pmatrix} 1 \\ -1 \\ 3 \end{pmatrix}$, then

Select one:

- a. $p(x) = 3x^2 + 2x + 4$ ✔
- b. $p(x) = 3x^2 + 2x + 5$
- c. $p(x) = 3x^2 + x - 3$
- d. $p(x) = x^2 - x + 3$

The correct answer is: $p(x) = 3x^2 + 2x + 4$

Question **5**

Incorrect

Mark 0.00 out of 1.00

Let $S = \{f \in C[-1, 1] : f(-1) = f(1)\}$, then S is a subspace of $C[-1, 1]$.

Select one:

- a. True
- b. False ✖

The correct answer is: True

Question **6**

Incorrect

Mark 0.00 out of 1.00

If $\{v_1, \cdots, v_n\}$ are linearly independent and v is not in Span$\{v_1, \cdots, v_n\}$, then $\{v_1, \cdots, v_n, v\}$ are linearly independent.

Select one:

- a. True
- b. False ✖

The correct answer is: True

Question **7**

Correct

Mark 1.00 out of 1.00

If A is a nonzero 3×2 matrix such that $Ax = 0$ has infinite number of solutions, then rank$(A) = 1$.

Select one:

- a. True ✔
- b. False

The correct answer is: True

Question **8**

Correct

Mark 1.00 out of 1.00

Let $S = \{ \begin{pmatrix} a+b+2c \\ a+2c \\ a+b+2c \end{pmatrix} : a, b \in \mathbb{R}\}$. Then dimension of S equals

Select one:

- a. 2 ✔
- b. 0
- c. 3
- d. 1

The correct answer is: 2

Question **9**

Correct

Mark 1.00 out of 1.00

$\dim\left(\text{span}(x^2, 3+x^2, x^2+1)\right)$ is

Select one:

- a. 0
- b. 1
- c. 2 ✔
- d. 3

The correct answer is: 2

Question **10**

Correct

Mark 1.00 out of 1.00

dimension of the subspace $S = \text{Span}\left\{A_1 = \begin{pmatrix} 2 & 1 \\ 0 & 1 \end{pmatrix}, A_2 \begin{pmatrix} -1 & 0 \\ 3 & 1 \end{pmatrix}, A_3 = \begin{pmatrix} -8 & -3 \\ 6 & -1 \end{pmatrix}\right\}$ is

Select one:

- a. 0
- b. 1
- c. 2 ✔
- d. 3

The correct answer is: 2

Question **11**

Correct

Mark 1.00 out of 1.00

Which of the following **is not a basis** for the corresponding space

Select one:

- a. $\{(1,1)^T, (2,-3)^T\}; \mathbb{R}^2$
- b. $\{(-2,-1,-1)^T, (-3,-3,0)^T, (2,0,2)^T\}; \mathbb{R}^3$ ✔
- c. $\{5-x, x-1\}; P_2$
- d. $\{x+4, 1-x^2, x^2+x+3\}; P_3$

The correct answer is: $\{(-2,-1,-1)^T, (-3,-3,0)^T, (2,0,2)^T\}; \mathbb{R}^3$

Question **12**

Correct

Mark 1.00 out of 1.00

The transition matrix from the standard basis $S = \left[e_1 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}, e_2 = \begin{pmatrix} 0 \\ 1 \end{pmatrix}\right]$ to the ordered basis $U = \left[u_1 = \begin{pmatrix} 1 \\ 2 \end{pmatrix}, u_2 = \begin{pmatrix} 2 \\ 5 \end{pmatrix}\right]$ is

Select one:

- a. $T = \begin{pmatrix} -1 & 2 \\ 2 & -5 \end{pmatrix}$
- b. $T = \begin{pmatrix} 5 & -2 \\ -2 & 1 \end{pmatrix}$ ✔
- c. $T = \begin{pmatrix} 1 & 2 \\ 2 & 5 \end{pmatrix}$
- d. $T = \begin{pmatrix} 1 & -2 \\ -2 & 5 \end{pmatrix}$

The correct answer is: $T = \begin{pmatrix} 5 & -2 \\ -2 & 1 \end{pmatrix}$

Question **13**

Correct

Mark 1.00 out of 1.00

If A is a 5×4-matrix, and $Ax = 0$ has only the zero solution, then rank$(A) = 4$.

Select one:

- a. True ✔
- b. False

The correct answer is: True

Question **14**

Correct

Mark 1.00 out of 1.00

If the columns of $A_{n\times n}$ are linearly independent and $b \in \mathbb{R}^n$, then the system $Ax = b$ has

Select one:

- a. exactly 2 solutions
- b. exactly one solution ✔
- c. no solution
- d. infinitely many solutions

The correct answer is: exactly one solution

Question **15**

Incorrect

Mark 0.00 out of 1.00

If A is a 3×5-matrix, rows of A are linearly independent, then

Select one:

- a. rank$(A) =$ nullity$(A) + 3$
- b. rank$(A) =$ nullity$(A) + 2$ ✖
- c. rank$(A) =$ nullity$(A) + 1$
- d. rank$(A) =$ nullity(A)

The correct answer is: rank$(A) =$ nullity$(A) + 1$

Question **16**

Correct

Mark 1.00 out of 1.00

Let $E = [3 - x, 2 + x]$, $F = [1, x]$ be ordered bases for P_2. The transition matrix from E to F is

Select one:

a. $\begin{pmatrix} -1 & 1 \\ 2 & 3 \end{pmatrix}$

b. $\begin{pmatrix} 1 & 2 \\ -1 & 3 \end{pmatrix}$

c. $\begin{pmatrix} 3 & 2 \\ -1 & 1 \end{pmatrix}$ ✔

d. $\begin{pmatrix} -1 & 1 \\ 3 & 2 \end{pmatrix}$

The correct answer is: $\begin{pmatrix} 3 & 2 \\ -1 & 1 \end{pmatrix}$

Question **17**

Correct

Mark 1.00 out of 1.00

If $\{v_1, v_2, v_3, v_4\}$ is a basis for a vector space V , then the set $\{v_1, v_2, v_3\}$ is

Select one:

a. linearly independent and not a spanning set for V. ✔

b. linearly independent and a spanning set for V.

c. linearly dependent and a spanning set

d. linearly dependent and not a spanning set for V.

The correct answer is: linearly independent and not a spanning set for V.

Question **18**

Correct

Mark 1.00 out of 1.00

If A is a 3×2 matrix, then

Select one:

a. The rows of A are linearly dependent ✔

b. The columns of A are linearly dependent

c. The columns of A are linearly independent

d. Rank$(A) = 3$

The correct answer is: The rows of A are linearly dependent

Question **19**

Incorrect

Mark 0.00 out of 1.00

Let A be an $m \times n$ matrix. If the rows of A are linearly dependent, then $n \leq m$

Select one:

a. True

b. False ✖

The correct answer is: True

Question **20**

Correct

Mark 1.00 out of 1.00

The vectors $\{x+1, x^2+2x+1, x^2+x+1\}$ form a basis for P_3.

Select one:

- a. True ✔
- b. False

The correct answer is: True

Question **21**

Correct

Mark 1.00 out of 1.00

If A is a 3×5 matrix, then

Select one:

- a. nullity$(A) \geq 2$ ✔
- b. The rows of A are linearly dependent
- c. $Rank(A) = 2$
- d. The columns of A are linearly independent

The correct answer is: nullity$(A) \geq 2$

Question **22**

Correct

Mark 1.00 out of 1.00

let A be a 4×7-matrix, if the row echelon form of A has 2 nonzero rows, then dim(column space of A) is

Select one:

- a. 2 ✔
- b. 3
- c. 5
- d. 7

The correct answer is: 2

Question **23**

Correct

Mark 1.00 out of 1.00

if $\{v_1, v_2, \cdots, v_k\}$ is a spanning set for $\mathbb{R}^{3\times 2}$, then

Select one:

- a. $k \leq 6$
- b. $k > 6$
- c. $k = 6$
- d. $k \geq 6$ ✔

The correct answer is: $k \geq 6$

Question **24**

Incorrect

Mark 0.00 out of 1.00

The coordinate vector of $6+8x$ with respect to the basis $[2x, 2]$ is $(4,3)^T$

Select one:

- a. False ✖
- b. True

The correct answer is: True

Question 25
Correct
Mark 1.00 out of 1.00

Let $E = [2 + x, 1 - x, x^2 + 1]$ be an ordered basis for P_3. If $p(x) = 2x^2 - 2x + 1$, then the coordinate vector of $p(x)$ with respect to E is

Select one:

a. $\begin{pmatrix} -2 \\ -3 \\ 2 \end{pmatrix}$

b. $\begin{pmatrix} -1 \\ 1 \\ 2 \end{pmatrix}$ ✔

c. $\begin{pmatrix} 2 \\ -3 \\ 1 \end{pmatrix}$

d. $\begin{pmatrix} 3 \\ 2 \\ -3 \end{pmatrix}$

The correct answer is: $\begin{pmatrix} -1 \\ 1 \\ 2 \end{pmatrix}$

Question 26
Incorrect
Mark 0.00 out of 1.00

If A is an $m \times n$-matrix, and columns of A are linearly independent, then

Select one:

a. $n \leq m$

b. $m \leq n$ ✖

c. $m = n + 1$

d. $m = n$

The correct answer is: $n \leq m$

Question 27
Correct
Mark 1.00 out of 1.00

Let $S = \{\begin{pmatrix} x \\ y \end{pmatrix} \in \mathbb{R}^2 : x = y + 1\}$, then S is a subspace of $\mathbb{R}^2$.

Select one:

a. False ✔

b. True

The correct answer is: False

Question 28
Incorrect
Mark 0.00 out of 1.00

If $A = \begin{pmatrix} -1 & -2 & -1 & 0 \\ 1 & 2 & 2 & 0 \\ -2 & -4 & 0 & 0 \end{pmatrix}$, then rank$(A) = 3$.

Select one:

a. False

b. True ✖

The correct answer is: False

Question **29**

Incorrect

Mark 0.00 out of 1.00

If the rows of an $n \times n$-matrix A form a basis for $\mathbb{R}^{1\times n}$, then the columns of A also form a basis for $\mathbb{R}^n$.

Select one:

- a. False ✖
- b. True

The correct answer is: True

Question **30**

Correct

Mark 1.00 out of 1.00

If A is a 4×6 matrix, then nullity of $A \geq 2$.

Select one:

- a. False
- b. True ✔

The correct answer is: True

Question **31**

Incorrect

Mark 0.00 out of 1.00

The vectors $\{(1, -1, 1)^T, (1, -1, 2)^T, (1, -2, 1)^T\}$ form a basis for $\mathbb{R}^3$.

Select one:

- a. True
- b. False ✖

The correct answer is: True

Question **32**

Correct

Mark 1.00 out of 1.00

If A is an $n \times n$ singular matrix, then

Select one:

- a. The columns of A are linearly dependent ✔
- b. $N(A) = \{0\}$
- c. The rows of A are linearly independent
- d. rank$(A) = n$

The correct answer is: The columns of A are linearly dependent

Started on	Sunday, 10 January 2021, 9:45 AM
State	Finished
Completed on	Sunday, 10 January 2021, 10:59 AM
Time taken	1 hour 14 mins
Grade	**22.00** out of 32.00 (**69**%)

Question **1**
Correct
Mark 1.00 out of 1.00

dimension of the subspace $S = \text{Span}\left\{A_1 = \begin{pmatrix} 0 & 2 \\ 1 & 1 \end{pmatrix}, A_2 \begin{pmatrix} 3 & -1 \\ 1 & 0 \end{pmatrix}, A_3 = \begin{pmatrix} 6 & -8 \\ -1 & -3 \end{pmatrix}\right\}$ is

Select one:

- a. 3
- b. 2 ✔
- c. 0
- d. 1

The correct answer is: 2

Question **2**
Correct
Mark 1.00 out of 1.00

If A is a 3×3-matrix, and $Ax = 0$ has only the zero solution, then nullity$(A) =$

Select one:

- a. 0 ✔
- b. 2
- c. 3
- d. 1

The correct answer is: 0

Question **3**
Correct
Mark 1.00 out of 1.00

dim$\big($span$(x^2, 3 + x^2, x^2 + 1)\big)$ is

Select one:

- a. 2 ✔
- b. 3
- c. 0
- d. 1

The correct answer is: 2

Question **4**
Incorrect
Mark 0.00 out of 1.00

if $\{v_1, v_2, \cdots, v_k\}$ is a spanning set for $\mathbb{R}^{3\times 2}$, then

Select one:
- a. $k \leq 6$ ✖
- b. $k = 6$
- c. $k \geq 6$
- d. $k > 6$

The correct answer is: $k \geq 6$

Question **5**
Correct
Mark 1.00 out of 1.00

Let $S = \{\begin{pmatrix} x \\ y \end{pmatrix} \in \mathbb{R}^2 : x = -y\}$, then S is a subspace of $\mathbb{R}^2$.

Select one:
- a. False
- b. True ✔

The correct answer is: True

Question **6**
Correct
Mark 1.00 out of 1.00

If $f_1, f_2, \cdots, f_n \in C^{n-1}[a, b]$ and $W[f_1, f_2, \cdots, f_n](x_0) = 0$ for some $x_0 \in [a, b]$, then $f_1, f_2, \cdots, f_n$ are linearly dependent.

Select one:
- a. False ✔
- b. True

The correct answer is: False

Question **7**
Incorrect
Mark 0.00 out of 1.00

If A is a nonzero 4×2-matrix and $Ax = 0$ has infinitely many solutions, then rank$(A) =$

Select one:
- a. 3
- b. 2 ✖
- c. 1
- d. 4

The correct answer is: 1

Question **8**
Correct
Mark 1.00 out of 1.00

The coordinate vector of $8 + 6x$ with respect to the basis $[2x, 2]$ is $(4, 3)^T$

Select one:
- a. True
- b. False ✔

The correct answer is: False

Question 9
Incorrect
Mark 0.00 out of 1.00

If $\{v_1, v_2, v_3, v_4\}$ forms a spanning set for a vector space V, $\dim(V) = 3$, v_4 can be written as a linear combination of v_1, v_2, v_3, then

Select one:

- a. $\{v_1, v_2, v_3\}$ are linearly dependent ✖
- b. $\{v_1, v_2, v_3\}$ is a basis for V
- c. v_1 can be written as a linear combination of v_2, v_3, v_4
- d. $\{v_1, v_2, v_3\}$ do not form a spanning set for V

The correct answer is: $\{v_1, v_2, v_3\}$ is a basis for V

Question 10
Correct
Mark 1.00 out of 1.00

Let V be a vector space, $\{v_1, v_2, \ldots v_n\}$ a spanning set for V, and $v \in V$, then the vectors $\{v_1, v_2, \ldots v_n, v\}$ form a spanning set for V.

Select one:

- a. False
- b. True ✔

The correct answer is: True

Question 11
Incorrect
Mark 0.00 out of 1.00

Let A be a 4×5-matrix, with $\text{rank}(A) = 3$. Then The rows of A are linearly dependent.

Select one:

- a. True
- b. False ✖

The correct answer is: True

Question 12
Incorrect
Mark 0.00 out of 1.00

Let A be a 2×4 matrix, and $\text{rank}(A) = 2$, then, the columns of A form a spanning set for $\mathbb{R}^2$.

Select one:

- a. False ✖
- b. True

The correct answer is: True

Question **13**

Incorrect

Mark 0.00 out of 1.00

The coordinate vector of $\begin{pmatrix} -3 \\ -2 \\ -5 \end{pmatrix}$ with respect to the ordered basis $[\begin{pmatrix} 1 \\ 1 \\ 1 \end{pmatrix}, \begin{pmatrix} 1 \\ 2 \\ 2 \end{pmatrix}, \begin{pmatrix} 2 \\ 3 \\ 4 \end{pmatrix}]$ is

Select one:

- a. $\begin{pmatrix} -1 \\ 4 \\ -3 \end{pmatrix}$
- b. $\begin{pmatrix} 1 \\ -4 \\ 3 \end{pmatrix}$
- c. $\begin{pmatrix} 3 \\ 2 \\ 5 \end{pmatrix}$
- d. $\begin{pmatrix} 1 \\ 2 \\ 3 \end{pmatrix}$ ✖

The correct answer is: $\begin{pmatrix} -1 \\ 4 \\ -3 \end{pmatrix}$

Question **14**

Correct

Mark 1.00 out of 1.00

Let A be a 4×3-matrix with nullity$(A) = 0$. Then rank$(A) = 1$

Select one:

- a. False ✔
- b. True

The correct answer is: False

Question **15**

Correct

Mark 1.00 out of 1.00

Let $S = \{\begin{pmatrix} a+b+2c \\ a+2c \\ a+b+2c \end{pmatrix} : a, b \in \mathbb{R}\}$. Then dimension of S equals

Select one:

- a. 2 ✔
- b. 3
- c. 0
- d. 1

The correct answer is: 2

Question **16**
Correct
Mark 1.00 out of 1.00

The transition matrix from the standard basis $S = \left[e_1 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}, e_2 = \begin{pmatrix} 0 \\ 1 \end{pmatrix}\right]$ to the ordered basis $U = \left[u_1 = \begin{pmatrix} 7 \\ 2 \end{pmatrix}, u_2 = \begin{pmatrix} 3 \\ 1 \end{pmatrix}\right]$ is

Select one:

- a. $T = \begin{pmatrix} -7 & 3 \\ 2 & -1 \end{pmatrix}$
- b. $T = \begin{pmatrix} 7 & 3 \\ 2 & 1 \end{pmatrix}$
- c. $T = \begin{pmatrix} 1 & -3 \\ -2 & 7 \end{pmatrix}$ ✔
- d. $T = \begin{pmatrix} 7 & -3 \\ -2 & 1 \end{pmatrix}$

The correct answer is: $T = \begin{pmatrix} 1 & -3 \\ -2 & 7 \end{pmatrix}$

Question **17**
Correct
Mark 1.00 out of 1.00

If A is a 3×3-matrix, and $Ax = 0$ has only the zero solution, then rank$(A) =$

Select one:

- a. 0
- b. 2
- c. 1
- d. 3 ✔

The correct answer is: 3

Question **18**
Correct
Mark 1.00 out of 1.00

The vectors $\{(1, -1, -4)^T, (1, -1, 1)^T, (1, -1, 2)^T\}$ form a basis for $\mathbb{R}^3$.

Select one:

- a. True
- b. False ✔

The correct answer is: False

Question **19**
Correct
Mark 1.00 out of 1.00

The functions $\sin x, \cos x, \sin(2x)$ in $C^2[0, 2\pi]$ are

Select one:

- a. linearly independent ✔
- b. linearly dependent

The correct answer is: linearly independent

Question **20**
Correct
Mark 1.00 out of 1.00

If $A = \begin{pmatrix} 1 & -2 & 1 & 0 \\ -1 & 2 & 2 & 0 \\ 2 & -4 & 0 & 0 \end{pmatrix}$, then rank$(A) = 3$.

Select one:
- a. False ✔
- b. True

The correct answer is: False

Question **21**
Correct
Mark 1.00 out of 1.00

The vectors $\{x+1, x^2+2x+1, x^2+x+1\}$ form a basis for P_3.

Select one:
- a. False
- b. True ✔

The correct answer is: True

Question **22**
Correct
Mark 1.00 out of 1.00

If A is a 3×5 matrix, then

Select one:
- a. The columns of A are linearly independent
- b. The rows of A are linearly dependent
- c. nullity$(A) \geq 2$ ✔
- d. $Rank(A) = 2$

The correct answer is: nullity$(A) \geq 2$

Question **23**
Correct
Mark 1.00 out of 1.00

The nullity of $A = \begin{pmatrix} 1 & 4 & 1 & 1 & 1 \\ 2 & 6 & -1 & 0 & -1 \\ 3 & 10 & 0 & 4 & 0 \end{pmatrix}$ is

Select one:
- a. 2 ✔
- b. 4
- c. 1
- d. 3

The correct answer is: 2

Question **24**
Correct
Mark 1.00 out of 1.00

If $f_1, f_2, \cdots, f_n \in C^{n-1}[a,b]$ and $W[f_1, f_2, \cdots, f_n](x_0) \neq 0$ for some $x_0 \in [a,b]$, then $f_1, f_2, \cdots, f_n$ are

Select one:
- a. linearly dependent
- b. form a spanning set for $C^{n-1}[a,b]$
- c. linearly independent. ✔

The correct answer is: linearly independent.

Question **25**
Incorrect
Mark 0.00 out of 1.00

let A be a 3×5-matrix, if the row echelon form of A has 1 nonzero row, then dim(column space of A) is

Select one:
- a. 0
- b. 2
- c. 3 ✖
- d. 1

The correct answer is: 1

Question **26**
Correct
Mark 1.00 out of 1.00

Let $E = [2+x, 1-x, x^2+1]$ be an ordered basis for P_3. If $p(x) = -3x^2 + x + 5$, then the coordinate vector of $p(x)$ with respect to E is

Select one:
- a. $\begin{pmatrix} 3 \\ 2 \\ -3 \end{pmatrix}$ ✔
- b. $\begin{pmatrix} 3 \\ -3 \\ 2 \end{pmatrix}$
- c. $\begin{pmatrix} 2 \\ -3 \\ 3 \end{pmatrix}$
- d. $\begin{pmatrix} 3 \\ 5 \\ 4 \end{pmatrix}$

The correct answer is: $\begin{pmatrix} 3 \\ 2 \\ -3 \end{pmatrix}$

Question **27**
Correct
Mark 1.00 out of 1.00

Let $E = [3 - x, 2 + x]$, $F = [x, 1]$ be ordered bases for P_2. The transition matrix from E to F is

Select one:

- a. $\begin{pmatrix} 1 & -1 \\ 2 & 3 \end{pmatrix}$
- b. $\begin{pmatrix} 3 & -1 \\ 2 & 1 \end{pmatrix}$
- c. $\begin{pmatrix} -1 & 3 \\ 1 & 2 \end{pmatrix}$
- d. $\begin{pmatrix} -1 & 1 \\ 3 & 2 \end{pmatrix}$ ✔

The correct answer is: $\begin{pmatrix} -1 & 1 \\ 3 & 2 \end{pmatrix}$

Question **28**
Correct
Mark 1.00 out of 1.00

Let A be a 4×3 matrix, and nullity$(A) = 0$, then

Select one:

- a. The columns of A are linearly independent ✔
- b. The rows of A are linearly independent
- c. rank$(A) = 1$
- d. the columns of A form a basis for $\mathbb{R}^4$

The correct answer is: The columns of A are linearly independent

Question **29**
Incorrect
Mark 0.00 out of 1.00

Let A be a 3×5 matrix, and nullity$(A) = 2$, then the columns of A form a aspanning set for $\mathbb{R}^3$

Select one:

- a. True
- b. False ✖

The correct answer is: True

Question **30**
Correct
Mark 1.00 out of 1.00

If A is a 3×5-matrix, rows of A are linearly independent, then

Select one:

- a. rank$(A) =$ nullity$(A) + 3$
- b. rank$(A) =$ nullity(A)
- c. rank$(A) =$ nullity$(A) + 2$
- d. rank$(A) =$ nullity$(A) + 1$ ✔

The correct answer is: rank$(A) =$ nullity$(A) + 1$

Do

Question 31
Incorrect
Mark 0.00 out of 1.00

If V is a vector space of dimension n, then any subset of V which has more than n vectors is a spanning set for V.

Select one:
- a. False
- b. True ✖

The correct answer is: False

Question 32
Incorrect
Mark 0.00 out of 1.00

Let $S = \{f \in C[-1,1] : f \text{ is an odd function } \}$, then S is a subspace of $C[-1,1]$.

Select one:
- a. False ✖
- b. True

The correct answer is: True

Jump to...

Announcements ▶

Dashboard / My courses / INTRODUCTION TO LINEAR ALGEBRA-Lecture-1201-Meta / General / Second Exam

Started on	Sunday, 10 January 2021, 9:55 AM
State	Finished
Completed on	Sunday, 10 January 2021, 11:09 AM
Time taken	1 hour 14 mins
Grade	**19.00** out of 32.00 (**59**%)

Question **1**
Incorrect
Mark 0.00 out of 1.00

If A is a 3×2 matrix, then

Select one:

- a. The rows of A are linearly dependent
- b. Rank$(A) = 3$
- c. The columns of A are linearly independent
- d. The columns of A are linearly dependent ✖

The correct answer is: The rows of A are linearly dependent

Question **2**
Incorrect
Mark 0.00 out of 1.00

The transition matrix from the standard basis $S = \left[e_1 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}, e_2 = \begin{pmatrix} 0 \\ 1 \end{pmatrix}\right]$ to the ordered basis $U = \left[u_1 = \begin{pmatrix} 1 \\ 3 \end{pmatrix}, u_2 = \begin{pmatrix} 2 \\ 7 \end{pmatrix}\right]$ is

Select one:

- a. $T = \begin{pmatrix} 1 & 2 \\ 3 & 7 \end{pmatrix}$
- b. $T = \begin{pmatrix} 1 & -2 \\ -3 & 7 \end{pmatrix}$ ✖
- c. $T = \begin{pmatrix} -7 & 2 \\ 3 & -1 \end{pmatrix}$
- d. $T = \begin{pmatrix} 7 & -2 \\ -3 & 1 \end{pmatrix}$

The correct answer is: $T = \begin{pmatrix} 7 & -2 \\ -3 & 1 \end{pmatrix}$

Question **3**
Incorrect
Mark 0.00 out of 1.00

If A is a 3×3-matrix, and $Ax = 0$ has only the zero solution, then rank$(A) =$

Select one:

- a. 3
- b. 0 ✖
- c. 2
- d. 1

The correct answer is: 3

Question 4
Correct
Mark 1.00 out of 1.00

The nullity of $A = \begin{pmatrix} 1 & 4 & 1 & 2 & 2 \\ 2 & 6 & -1 & 2 & 1 \\ 3 & 10 & 0 & 4 & 3 \end{pmatrix}$ is

Select one:
- a. 1
- b. 3 ✓
- c. 0
- d. 2

The correct answer is: 3

Question 5
Correct
Mark 1.00 out of 1.00

If $A = \begin{pmatrix} 1 & -2 & 1 & 0 \\ -1 & 2 & 2 & 0 \\ 2 & -2 & 0 & 0 \end{pmatrix}$, then rank$(A) = 3$.

Select one:
- a. True ✓
- b. False

The correct answer is: True

Question 6
Incorrect
Mark 0.00 out of 1.00

If A is a 3×5-matrix, rows of A are linearly independent, then

Select one:
- a. rank$(A) =$ nullity$(A) + 1$
- b. rank$(A) =$ nullity(A)
- c. rank$(A) =$ nullity$(A) + 2$ ✗
- d. rank$(A) =$ nullity$(A) + 3$

The correct answer is: rank$(A) =$ nullity$(A) + 1$

Question 7
Correct
Mark 1.00 out of 1.00

let A be a 3×5-matrix, if the row echelon form of A has 1 nonzero row, then dim(column space of A) is

Select one:
- a. 2
- b. 3
- c. 1 ✓
- d. 0

The correct answer is: 1

Question 8
Incorrect
Mark 0.00 out of 1.00

If $T_{n\times n}$ is a transition matrix between two bases for a vector space V, dim$(V) = n > 0$, then

Select one:

- a. nullity$(T) = n$ ✖
- b. T is nonsingular
- c. det$(T) = 1$
- d. rank$(T) = 1$

The correct answer is: T is nonsingular

Question 9
Incorrect
Mark 0.00 out of 1.00

If S is a subset of a vector space V, and $0 \in S$, then S is a subspace of V.

Select one:

- a. True ✖
- b. False

The correct answer is: False

Question 10
Incorrect
Mark 0.00 out of 1.00

If A is an $n \times n$ singular matrix, then

Select one:

- a. rank$(A) = n$ ✖
- b. $N(A) = \{0\}$
- c. The columns of A are linearly dependent
- d. The rows of A are linearly independent

The correct answer is: The columns of A are linearly dependent

Question 11
Correct
Mark 1.00 out of 1.00

Let A be a 5×4 matrix, and rank$(A) = 4$

Select one:

- a. The rows of A are linearly independent
- b. A has a row of zeros
- c. nullity$(A) = 1$
- d. The columns of A are linearly independent ✔

The correct answer is: The columns of A are linearly independent

Question **12**
Correct
Mark 1.00 out of 1.00

Let $S = \{\begin{pmatrix} x \\ y \end{pmatrix} \in \mathbb{R}^2 : x = 1 - y\}$, then S is a subspace of $\mathbb{R}^2$.

Select one:
- a. True
- b. False ✔

The correct answer is: False

Question **13**
Correct
Mark 1.00 out of 1.00

Which of the following **is not a basis** for the corresponding space

Select one:
- a. $\{(-2,-1,-1)^T, (-3,-3,0)^T, (2,0,2)^T\}$; $\mathbb{R}^3$ ✔
- b. $\{x+4, 1-x^2, x^2+x+3\}$; P_3
- c. $\{5-x, x-1\}$; P_2
- d. $\{(1,1)^T, (2,-3)^T\}$; $\mathbb{R}^2$

The correct answer is: $\{(-2,-1,-1)^T, (-3,-3,0)^T, (2,0,2)^T\}$; $\mathbb{R}^3$

Question **14**
Correct
Mark 1.00 out of 1.00

If A is a 4×6 matrix, then nullity of $A \geq 2$.

Select one:
- a. True ✔
- b. False

The correct answer is: True

Question **15**
Incorrect
Mark 0.00 out of 1.00

The vectors $\{(1,-1,1)^T, (1,-3,2)^T, (1,-2,1)^T\}$ form a basis for $\mathbb{R}^3$.

Select one:
- a. False ✖
- b. True

The correct answer is: True

Question **16**
Correct
Mark 1.00 out of 1.00

If A, B are two row equivalent $m \times n$-matrices, then rank(A) =rank(B)

Select one:
- a. True ✔
- b. False

The correct answer is: True

Question **17**
Correct
Mark 1.00 out of 1.00

If A is a 3×3-matrix, and $Ax = 0$ has only the zero solution, then nullity$(A) =$

Select one:
- a. 0 ✔
- b. 2
- c. 3
- d. 1

The correct answer is: 0

Question **18**
Correct
Mark 1.00 out of 1.00

If A is a nonzero 3×2 matrix such that $Ax = 0$ has infinite number of solutions, then rank$(A) = 1$.

Select one:
- a. False
- b. True ✔

The correct answer is: True

Question **19**
Correct
Mark 1.00 out of 1.00

Let $S = \left\{ \begin{pmatrix} a+b+2c \\ a+2c \\ a+b+2c \end{pmatrix} : a, b \in \mathbb{R} \right\}$. Then dimension of S equals

Select one:
- a. 1
- b. 0
- c. 3
- d. 2 ✔

The correct answer is: 2

Question **20**
Correct
Mark 1.00 out of 1.00

If A is an $n \times n$ nonsingular matrix, then nullity of $(A) = 0$

Select one:
- a. False
- b. True ✔

The correct answer is: True

Question **21**
Incorrect
Mark 0.00 out of 1.00

The functions $\sin x, \cos x, \sin(2x)$ in $C^2[0, 2\pi]$ are

Select one:
- a. linearly independent
- b. linearly dependent ✖

The correct answer is: linearly independent

Question **22**
Correct
Mark 1.00 out of 1.00

dimension of the subspace $S = \text{Span}\left\{A_1 = \begin{pmatrix} 0 & 1 \\ 2 & 1 \end{pmatrix}, A_2 \begin{pmatrix} 3 & 1 \\ -1 & 0 \end{pmatrix}, A_3 = \begin{pmatrix} 6 & -1 \\ -8 & -3 \end{pmatrix}\right\}$ is

Select one:
- a. 0
- b. 3
- c. 1
- d. 2 ✔

The correct answer is: 2

Question **23**
Correct
Mark 1.00 out of 1.00

let A be a 4×7-matrix, if the row echelon form of A has 2 nonzero rows, then dim(column space of A) is

Select one:
- a. 7
- b. 3
- c. 2 ✔
- d. 5

The correct answer is: 2

Question **24**
Incorrect
Mark 0.00 out of 1.00

If $v_1, v_2, \cdots, v_k$ are vectors in a vector space V, and Span$(v_1, v_2, \cdots, v_k) =$ Span$(v_1, v_2, \cdots, v_{k-1})$, then v_k can be written as alinear combination of $v_1, v_2, \cdots, v_{k-1}$

Select one:
- a. True
- b. False ✖

The correct answer is: True

Question **25**
Correct
Mark 1.00 out of 1.00

Let $E = [3 - x, 2 + x]$, $F = [1, x]$ be ordered bases for P_2. The transition matrix from E to F is

Select one:
- a. $\begin{pmatrix} 1 & 2 \\ -1 & 3 \end{pmatrix}$
- b. $\begin{pmatrix} -1 & 1 \\ 3 & 2 \end{pmatrix}$
- c. $\begin{pmatrix} -1 & 1 \\ 2 & 3 \end{pmatrix}$
- d. $\begin{pmatrix} 3 & 2 \\ -1 & 1 \end{pmatrix}$ ✔

The correct answer is: $\begin{pmatrix} 3 & 2 \\ -1 & 1 \end{pmatrix}$

Question 26
Incorrect
Mark 0.00 out of 1.00

Let V be a vector space, $\{v_1, v_2, \ldots v_n\}$ a spanning set for V, and $v \in V$, then the vectors $\{v_1, v_2, \ldots v_n, v\}$ form a spanning set for V.

Select one:

- a. False ✖
- b. True

The correct answer is: True

Question 27
Incorrect
Mark 0.00 out of 1.00

Let $E = [2 + x, 1 - x, x^2 + 1]$ be an ordered basis for P_3. If $p(x) = 3x^2 - 3x$, then the coordinate vector of $p(x)$ with respect to E is

Select one:

- a. $\begin{pmatrix} 3 \\ 2 \\ -3 \end{pmatrix}$ ✖
- b. $\begin{pmatrix} -2 \\ 1 \\ 3 \end{pmatrix}$
- c. $\begin{pmatrix} 2 \\ -3 \\ 1 \end{pmatrix}$
- d. $\begin{pmatrix} -2 \\ -3 \\ 2 \end{pmatrix}$

The correct answer is: $\begin{pmatrix} -2 \\ 1 \\ 3 \end{pmatrix}$

Question 28
Correct
Mark 1.00 out of 1.00

If A is an $m \times n$-matrix, and columns of A form a spanning set for $\mathbb{R}^m$, then

Select one:

- a. $n \leq m$
- b. $m = n$
- c. $m = n + 1$
- d. $m \leq n$ ✔

The correct answer is: $m \leq n$

Question 29
Correct
Mark 1.00 out of 1.00

Let $S = \{f \in C[-1, 1] : f \text{ is an odd function } \}$, then S is a subspace of $C[-1, 1]$.

Select one:

- a. False
- b. True ✔

The correct answer is: True

Question **30**
Correct
Mark 1.00 out of 1.00

If A is a 4×3 matrix such that $N(A) = \{0\}$, and b can be written as a linear combination of the columns of A, then

Select one:

- a. The system $Ax = b$ has exactly one solution ✔
- b. The system $Ax = b$ has infinitely many solutions
- c. The system $Ax = b$ is inconsistent
- d. The system $Ax = b$ has exactly two solutions

The correct answer is: The system $Ax = b$ has exactly one solution

Question **31**
Incorrect
Mark 0.00 out of 1.00

The coordinate vector of $6 + 4x$ with respect to the basis $[2x, 2]$ is $(3, 2)^T$

Select one:

- a. False
- b. True ✖

The correct answer is: False

Question **32**
Correct
Mark 1.00 out of 1.00

The vectors $\{x + 1, x^2 + 2x + 1, x^2 + x + 1\}$ form a basis for P_3.

Select one:

- a. False
- b. True ✔

The correct answer is: True

Jump to...

Announcements ▶

Data retention summary

[Dashboard](#) / My courses / INTRODUCTION TO LINEAR ALGEBRA-Lecture-1201-Meta / General / Second Exam

Started on	Sunday, 10 January 2021, 9:47 AM
State	Finished
Completed on	Sunday, 10 January 2021, 10:33 AM
Time taken	45 mins 22 secs
Grade	**30.00** out of 32.00 (**94**%)

Question **1**
Correct
Mark 1.00 out of 1.00

The vectors $\{x^2+2x+1, x-1, x^2+x+1\}$ form a basis for P_3.

Select one:
- a. False
- b. True ✔

The correct answer is: True

Question **2**
Correct
Mark 1.00 out of 1.00

Let $E=[2+x, 1-x, x^2+1]$ be an ordered basis for P_3. If $p(x)=2x^2-2x+1$, then the coordinate vector of $p(x)$ with respect to E is

Select one:
- a. $\begin{pmatrix} -1 \\ 1 \\ 2 \end{pmatrix}$ ✔
- b. $\begin{pmatrix} 3 \\ 2 \\ -3 \end{pmatrix}$
- c. $\begin{pmatrix} 2 \\ -3 \\ 1 \end{pmatrix}$
- d. $\begin{pmatrix} -2 \\ -3 \\ 2 \end{pmatrix}$

The correct answer is: $\begin{pmatrix} -1 \\ 1 \\ 2 \end{pmatrix}$

Question **3**
Correct
Mark 1.00 out of 1.00

If A is a nonzero 4×2-matrix and $Ax=0$ has infinitely many solutions, then rank$(A)=$

Select one:
- a. 4
- b. 3
- c. 1 ✔
- d. 2

The correct answer is: 1

Question **4**
Correct
Mark 1.00 out of 1.00

If $A = \begin{pmatrix} 1 & -2 & 1 & 0 \\ -1 & 2 & 3 & 0 \\ 2 & -1 & 0 & 0 \end{pmatrix}$, then rank$(A) = 3$.

Select one:
- a. True ✔
- b. False

The correct answer is: True

Question **5**
Correct
Mark 1.00 out of 1.00

Every spanning set for $\mathbb{R}^3$ contains at least 3 vectors.

Select one:
- a. False
- b. True ✔

The correct answer is: True

Question **6**
Correct
Mark 1.00 out of 1.00

The transition matrix from the standard basis $S = \left[e_1 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}, e_2 = \begin{pmatrix} 0 \\ 1 \end{pmatrix}\right]$ to the ordered basis $U = \left[u_1 = \begin{pmatrix} 1 \\ 3 \end{pmatrix}, u_2 = \begin{pmatrix} 2 \\ 7 \end{pmatrix}\right]$ is

Select one:
- a. $T = \begin{pmatrix} 1 & 2 \\ 3 & 7 \end{pmatrix}$
- b. $T = \begin{pmatrix} 1 & -2 \\ -3 & 7 \end{pmatrix}$
- c. $T = \begin{pmatrix} -7 & 2 \\ 3 & -1 \end{pmatrix}$
- d. $T = \begin{pmatrix} 7 & -2 \\ -3 & 1 \end{pmatrix}$ ✔

The correct answer is: $T = \begin{pmatrix} 7 & -2 \\ -3 & 1 \end{pmatrix}$

Question **7**
Correct
Mark 1.00 out of 1.00

If A is a 3×4-matrix, rows of A are linearly independent, then

Select one:
- a. rank$(A) = 3-$ nullity(A)
- b. nullity$(A) = 1$ ✔
- c. nullity$(A) = 3$
- d. rank$(A) =$ nullity(A)

The correct answer is: nullity$(A) = 1$

Question 8
Correct
Mark 1.00 out of 1.00

The coordinate vector of $8 + 6x$ with respect to the basis $[2, 2x]$ is $(4, 3)^T$

Select one:
- a. False
- b. True

The correct answer is: True

Question 9
Correct
Mark 1.00 out of 1.00

The rank of $A = \begin{pmatrix} 1 & 4 & 1 & 2 & 0 \\ 2 & 6 & -1 & 2 & -1 \\ 3 & 10 & 0 & 4 & 0 \end{pmatrix}$ is

Select one:
- a. 4
- b. 1
- c. 2
- d. 3

The correct answer is: 3

Question 10
Correct
Mark 1.00 out of 1.00

If A is an $n \times n$ singular matrix, then

Select one:
- a. $N(A) = \{0\}$
- b. rank$(A) = n$
- c. The columns of A are linearly dependent
- d. The rows of A are linearly independent

The correct answer is: The columns of A are linearly dependent

Question 11
Correct
Mark 1.00 out of 1.00

If A is an $m \times n$-matrix, and columns of A are linearly independent, then

Select one:
- a. $m = n$
- b. $n \leq m$
- c. $m \leq n$
- d. $m = n + 1$

The correct answer is: $n \leq m$

Question **12**
Correct
Mark 1.00 out of 1.00

Let $E = [3 - x, 2 + x]$, $F = [1, x]$ be ordered bases for P_2. The transition matrix from E to F is

Select one:
- a. $\begin{pmatrix} 1 & 2 \\ -1 & 3 \end{pmatrix}$
- b. $\begin{pmatrix} 3 & 2 \\ -1 & 1 \end{pmatrix}$ ✔
- c. $\begin{pmatrix} -1 & 1 \\ 2 & 3 \end{pmatrix}$
- d. $\begin{pmatrix} -1 & 1 \\ 3 & 2 \end{pmatrix}$

The correct answer is: $\begin{pmatrix} 3 & 2 \\ -1 & 1 \end{pmatrix}$

Question **13**
Correct
Mark 1.00 out of 1.00

Let $S = \{f \in C[-1,1] : f \text{ is an odd function } \}$, then S is a subspace of $C[-1,1]$.

Select one:
- a. True ✔
- b. False

The correct answer is: True

Question **14**
Correct
Mark 1.00 out of 1.00

The vectors $\{(1,-1,1)^T, (1,-1,2)^T, (1,-1,1)^T\}$ form a basis for $\mathbb{R}^3$.

Select one:
- a. True
- b. False ✔

The correct answer is: False

Question **15**
Correct
Mark 1.00 out of 1.00

If A is a 3×3-matrix, and $Ax = 0$ has only the zero solution, then rank$(A) =$

Select one:
- a. 0
- b. 3 ✔
- c. 2
- d. 1

The correct answer is: 3

Question **16**

Correct

Mark 1.00 out of 1.00

The coordinate vector of $\begin{pmatrix} -3 \\ -2 \\ -5 \end{pmatrix}$ with respect to the ordered basis $\left[\begin{pmatrix} 1 \\ 1 \\ 1 \end{pmatrix}, \begin{pmatrix} 1 \\ 2 \\ 2 \end{pmatrix}, \begin{pmatrix} 2 \\ 3 \\ 4 \end{pmatrix} \right]$ is

Select one:

- a. $\begin{pmatrix} 1 \\ -4 \\ 3 \end{pmatrix}$
- b. $\begin{pmatrix} 1 \\ 2 \\ 3 \end{pmatrix}$
- c. $\begin{pmatrix} 3 \\ 2 \\ 5 \end{pmatrix}$
- d. $\begin{pmatrix} -1 \\ 4 \\ -3 \end{pmatrix}$ ✔

The correct answer is: $\begin{pmatrix} -1 \\ 4 \\ -3 \end{pmatrix}$

Question **17**

Correct

Mark 1.00 out of 1.00

Let $S = \left\{ \begin{pmatrix} a+b+2c \\ a+2c \\ a+b+2c \end{pmatrix} : a, b \in \mathbb{R} \right\}$. Then dimension of S equals

Select one:

- a. 2 ✔
- b. 3
- c. 0
- d. 1

The correct answer is: 2

Question **18**

Incorrect

Mark 0.00 out of 1.00

dimension of the subspace $S = \text{Span}\left\{ A_1 = \begin{pmatrix} 1 & 1 \\ 2 & 0 \end{pmatrix}, A_2 \begin{pmatrix} 0 & 1 \\ -1 & 3 \end{pmatrix}, A_3 = \begin{pmatrix} -3 & -1 \\ -8 & 6 \end{pmatrix} \right\}$ is

Select one:

- a. 2
- b. 0
- c. 3 ✘
- d. 1

The correct answer is: 2

Question **19**
Correct
Mark 1.00 out of 1.00

If A is an $m \times n$-matrix, and columns of A form a spanning set for $\mathbb{R}^m$, then

Select one:
- a. $m \leq n$ ✔
- b. $n \leq m$
- c. $m = n$
- d. $m = n + 1$

The correct answer is: $m \leq n$

Question **20**
Correct
Mark 1.00 out of 1.00

Let $E = [2 + x, 1 - x, x^2 + 1]$ be an ordered basis for P_3. If $[p(x)]_E = \begin{pmatrix} 1 \\ -1 \\ 3 \end{pmatrix}$, then

Select one:
- a. $p(x) = 3x^2 + 2x + 4$ ✔
- b. $p(x) = x^2 - x + 3$
- c. $p(x) = 3x^2 + 2x + 5$
- d. $p(x) = 3x^2 + x - 3$

The correct answer is: $p(x) = 3x^2 + 2x + 4$

Question **21**
Correct
Mark 1.00 out of 1.00

If $\{v_1, v_2, v_3, v_4\}$ is a basis for a vector space V , then the set $\{v_1, v_2, v_3\}$ is

Select one:
- a. linearly dependent and a spanning set
- b. linearly independent and a spanning set for V.
- c. linearly dependent and not a spanning set for V.
- d. linearly independent and not a spanning set for V. ✔

The correct answer is: linearly independent and not a spanning set for V.

Question **22**
Incorrect
Mark 0.00 out of 1.00

If A is 5×3-matrix, rank$(A) = 3$, then the system $Ax = b$ has infinitely many solutions for every $b \in \mathbb{R}^3$.

Select one:
- a. True ✖
- b. False

The correct answer is: False

Question **23**
Correct
Mark 1.00 out of 1.00

Let V be a vector space, $\{v_1, v_2, \ldots v_n\}$ a spanning set for V, and $v \in V$, then the vectors $\{v_1, v_2, \ldots v_n, v\}$ form a spanning set for V.

Select one:
- a. False
- b. True ✔

The correct answer is: True

Question **24**
Correct
Mark 1.00 out of 1.00

Every linearly independent set of vectors in $\mathbb{R}^4$ has exactly 4 vectors.

Select one:
- a. False ✔
- b. True

The correct answer is: False

Question **25**
Correct
Mark 1.00 out of 1.00

If A is an $n \times n$-matrix and for each $b \in \mathbb{R}^n$ the system $Ax = b$ has a unique solution, then

Select one:
- a. rank$(A) = n - 1$
- b. A is nonsingular ✔
- c. nullity$(A) = 1$
- d. A is singular

The correct answer is: A is nonsingular

Question **26**
Correct
Mark 1.00 out of 1.00

Let $S = \{\begin{pmatrix} x \\ y \end{pmatrix} \in \mathbb{R}^2 : x = 1 - y\}$, then S is a subspace of $\mathbb{R}^2$.

Select one:
- a. True
- b. False ✔

The correct answer is: False

Question **27**
Correct
Mark 1.00 out of 1.00

If A is a 4×3 matrix such that $N(A) = \{0\}$, and b can be written as a linear combination of the columns of A, then

Select one:
- a. The system $Ax = b$ has exactly two solutions
- b. The system $Ax = b$ has exactly one solution ✔
- c. The system $Ax = b$ has infinitely many solutions
- d. The system $Ax = b$ is inconsistent

The correct answer is: The system $Ax = b$ has exactly one solution

Question 28
Correct
Mark 1.00 out of 1.00

Let A be a 4×3-matrix with nullity$(A) = 0$. Then rank$(A) = 1$

Select one:
- a. True
- b. False ✔

The correct answer is: False

Question 29
Correct
Mark 1.00 out of 1.00

If the columns of $A_{n\times n}$ are linearly independent and $b \in \mathbb{R}^n$, then the system $Ax = b$ is inconsistent.

Select one:
- a. False ✔
- b. True

The correct answer is: False

Question 30
Correct
Mark 1.00 out of 1.00

Let V be a vector space of dimension 4 and $W = \{v_1, v_2, v_3, v_4, v_5\}$ a set of nonzero vectors of V, then

Select one:
- a. W is a basis
- b. W is linearly independent
- c. W is a spanning set
- d. W is linearly dependent ✔

The correct answer is: W is linearly dependent

Question 31
Correct
Mark 1.00 out of 1.00

If A is a 3×5-matrix, rows of A are linearly independent, then

Select one:
- a. rank$(A) =$ nullity$(A) + 1$ ✔
- b. rank$(A) =$ nullity$(A) + 3$
- c. rank$(A) =$ nullity(A)
- d. rank$(A) =$ nullity$(A) + 2$

The correct answer is: rank$(A) =$ nullity$(A) + 1$

Question 32
Correct
Mark 1.00 out of 1.00

If $v_1, v_2, \cdots, v_n \in V$, dim$(V) = n$ and $v_1, v_2, \cdots, v_n$ are linearly independent, then Span $(v_1, v_2, \cdots, v_n) = V$, .

Select one:
- a. True ✔
- b. False

The correct answer is: True

Jump to...

Announcements ►

Data retention summary

Started on	Sunday, 10 January 2021, 9:46 AM
State	Finished
Completed on	Sunday, 10 January 2021, 11:01 AM
Time taken	1 hour 15 mins
Grade	**25.00** out of 32.00 (**78**%)

Question **1**
Correct
Mark 1.00 out of 1.00

If $\{v_1, v_2, v_3, v_4\}$ is a basis for a vector space V , then the set $\{v_1, v_2, v_3\}$ is

Select one:
- a. linearly dependent and not a spanning set for V.
- b. linearly independent and not a spanning set for V. ✔
- c. linearly independent and a spanning set for V.
- d. linearly dependent and a spanning set

The correct answer is: linearly independent and not a spanning set for V.

Question **2**
Correct
Mark 1.00 out of 1.00

If A is a 3×5-matrix, rows of A are linearly independent, then

Select one:
- a. rank(A) = nullity$(A) + 2$
- b. rank(A) = nullity(A)
- c. rank(A) = nullity$(A) + 3$
- d. rank(A) = nullity$(A) + 1$ ✔

The correct answer is: rank(A) = nullity$(A) + 1$

Question **3**
Correct
Mark 1.00 out of 1.00

If A is a 3×2 matrix, then

Select one:
- a. The columns of A are linearly independent
- b. The rows of A are linearly dependent ✔
- c. Rank$(A) = 3$
- d. The columns of A are linearly dependent

The correct answer is: The rows of A are linearly dependent

Question **4**
Incorrect
Mark 0.00 out of 1.00

The coordinate vector of $6 + 4x$ with respect to the basis $[2x, 2]$ is $(3, 2)^T$

Select one:
- a. True ✖
- b. False

The correct answer is: False

Question **5**

Correct

Mark 1.00 out of 1.00

The rank of $A = \begin{pmatrix} 1 & 4 & 1 & 2 & 2 \\ 2 & 6 & -1 & 2 & 1 \\ 3 & 10 & 0 & 4 & 3 \end{pmatrix}$ is

Select one:

- a. 3
- b. 1
- c. 2 ✔
- d. 4

The correct answer is: 2

Question **6**

Correct

Mark 1.00 out of 1.00

If $A = \begin{pmatrix} -1 & -2 & -1 & 0 \\ 1 & 2 & 2 & 0 \\ -2 & -4 & 0 & 0 \end{pmatrix}$, then rank$(A) = 3$.

Select one:

- a. True
- b. False ✔

The correct answer is: False

Question **7**

Correct

Mark 1.00 out of 1.00

The vectors $\{-x+1, 2x^2+3x+3, x^2+x+2\}$ form a basis for P_3.

Select one:

- a. False ✔
- b. True

The correct answer is: False

Question **8**

Correct

Mark 1.00 out of 1.00

Let V be a vector space, $v_1, v_2, \ldots v_n \in V$ be linearly independent, and $v \in V$, then the vectors $v_1, v_2, \ldots v_n, v$ are linearly independent.

Select one:

- a. True
- b. False ✔

The correct answer is: False

Question 9
Correct
Mark 1.00 out of 1.00

dimension of the subspace $S = \text{Span}\left\{A_1 = \begin{pmatrix} 0 & 1 \\ 2 & 1 \end{pmatrix}, A_2 \begin{pmatrix} 3 & 1 \\ -1 & 0 \end{pmatrix}, A_3 = \begin{pmatrix} 6 & -1 \\ -8 & -3 \end{pmatrix}\right\}$ is

Select one:
- a. 1
- b. 3
- c. 2 ✔
- d. 0

The correct answer is: 2

Question 10
Incorrect
Mark 0.00 out of 1.00

If $T_{n\times n}$ is a transition matrix between two bases for a vector space V, dim$(V) = n > 0$, then

Select one:
- a. rank$(T) = 1$ ✖
- b. det$(T) = 1$
- c. nullity$(T) = n$
- d. T is nonsingular

The correct answer is: T is nonsingular

Question 11
Correct
Mark 1.00 out of 1.00

Let $S = \{f \in C[-1, 1] : f(-1) = f(1)\}$, then S is a subspace of $C[-1, 1]$.

Select one:
- a. True ✔
- b. False

The correct answer is: True

Question 12
Correct
Mark 1.00 out of 1.00

Let A be a 4×6 matrix, and nullity$(A) = 2$, then the system $Ax = b$ has infinite number of solutions for every $b \in \mathbb{R}^4$.

Select one:
- a. True ✔
- b. False

The correct answer is: True

Question 13
Correct
Mark 1.00 out of 1.00

Let $S = \{\begin{pmatrix} x \\ y \end{pmatrix} \in \mathbb{R}^2 : x = 1 - y\}$, then S is a subspace of $\mathbb{R}^2$.

Select one:
- a. True
- b. False ✔

The correct answer is: False

Question **14**
Correct
Mark 1.00 out of 1.00

dim$\left(\text{span}(x^2, 3+x^2, x^2+1)\right)$ is

Select one:
- a. 1
- b. 0
- c. 3
- d. 2 ✔

The correct answer is: 2

Question **15**
Correct
Mark 1.00 out of 1.00

If $v_1, v_2, \cdots, v_n \in V$, dim$(V) = n$ and $v_1, v_2, \cdots, v_n$ are linearly independent, then Span $(v_1, v_2, \cdots, v_n) = V$, .

Select one:
- a. False
- b. True ✔

The correct answer is: True

Question **16**
Correct
Mark 1.00 out of 1.00

let A be a 3×5-matrix, if the row echelon form of A has 1 nonzero row, then dim(column space of A) is

Select one:
- a. 2
- b. 0
- c. 3
- d. 1 ✔

The correct answer is: 1

Question **17**
Incorrect
Mark 0.00 out of 1.00

If $f_1, f_2, \cdots, f_n \in C^{n-1}[a, b]$ and $W[f_1, f_2, \cdots, f_n](x_0) = 0$ for some $x_0 \in [a, b]$, then $f_1, f_2, \cdots, f_n$ are linearly dependent.

Select one:
- a. False
- b. True ✖

The correct answer is: False

Question **18**
Incorrect
Mark 0.00 out of 1.00

Let $E = [3 - x, 2 + x]$, $F = [1, x]$ be ordered bases for P_2. The transition matrix from E to F is

Select one:

a. $\begin{pmatrix} -1 & 1 \\ 3 & 2 \end{pmatrix}$

b. $\begin{pmatrix} 1 & 2 \\ -1 & 3 \end{pmatrix}$

c. $\begin{pmatrix} -1 & 1 \\ 2 & 3 \end{pmatrix}$ ✖

d. $\begin{pmatrix} 3 & 2 \\ -1 & 1 \end{pmatrix}$

The correct answer is: $\begin{pmatrix} 3 & 2 \\ -1 & 1 \end{pmatrix}$

Question **19**
Correct
Mark 1.00 out of 1.00

Let $E = [2 + x, 1 - x, x^2 + 1]$ be an ordered basis for P_3. If $p(x) = -3x^2 + x + 5$, then the coordinate vector of $p(x)$ with respect to E is

Select one:

a. $\begin{pmatrix} 3 \\ -3 \\ 2 \end{pmatrix}$

b. $\begin{pmatrix} 3 \\ 5 \\ 4 \end{pmatrix}$

c. $\begin{pmatrix} 2 \\ -3 \\ 3 \end{pmatrix}$

d. $\begin{pmatrix} 3 \\ 2 \\ -3 \end{pmatrix}$ ✔

The correct answer is: $\begin{pmatrix} 3 \\ 2 \\ -3 \end{pmatrix}$

Question **20**

Incorrect

Mark 0.00 out of 1.00

The transition matrix from the standard basis $S = \left[e_1 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}, e_2 = \begin{pmatrix} 0 \\ 1 \end{pmatrix}\right]$ to the ordered basis $U = \left[u_1 = \begin{pmatrix} 2 \\ 3 \end{pmatrix}, u_2 = \begin{pmatrix} 1 \\ 2 \end{pmatrix}\right]$ is

Select one:

- a. $T = \begin{pmatrix} 2 & -1 \\ -3 & 2 \end{pmatrix}$
- b. $T = \begin{pmatrix} 2 & 3 \\ 1 & 2 \end{pmatrix}$
- c. $T = \begin{pmatrix} 2 & 1 \\ 3 & 2 \end{pmatrix}$ ✖
- d. $T = \begin{pmatrix} -2 & 1 \\ 3 & -2 \end{pmatrix}$

The correct answer is: $T = \begin{pmatrix} 2 & -1 \\ -3 & 2 \end{pmatrix}$

Question **21**

Correct

Mark 1.00 out of 1.00

The coordinate vector of $\begin{pmatrix} -3 \\ -2 \\ -5 \end{pmatrix}$ with respect to the ordered basis [$\begin{pmatrix} 1 \\ 1 \\ 1 \end{pmatrix}, \begin{pmatrix} 1 \\ 2 \\ 2 \end{pmatrix}, \begin{pmatrix} 2 \\ 3 \\ 4 \end{pmatrix}$] is

Select one:

- a. $\begin{pmatrix} 1 \\ 2 \\ 3 \end{pmatrix}$
- b. $\begin{pmatrix} 3 \\ 2 \\ 5 \end{pmatrix}$
- c. $\begin{pmatrix} 1 \\ -4 \\ 3 \end{pmatrix}$
- d. $\begin{pmatrix} -1 \\ 4 \\ -3 \end{pmatrix}$ ✔

The correct answer is: $\begin{pmatrix} -1 \\ 4 \\ -3 \end{pmatrix}$

Question **22**

Correct

Mark 1.00 out of 1.00

If two nonzero vectors in a vector space V are linearly dependent, then each of them is a scalar multiple of the other.

Select one:

- a. True ✔
- b. False

The correct answer is: True

Question **23**
Incorrect
Mark 0.00 out of 1.00

Which of the following **is not a basis** for the corresponding space

Select one:

a. $\{x+4, 1-x^2, x^2+x+3\}$; P_3

b. $\{(1,1)^T, (2,-3)^T\}$; $\mathbb{R}^2$

c. $\{5-x, x-1\}$; P_2

d. $\{(-2,-1,-1)^T, (-3,-3,0)^T, (2,0,2)^T\}$; $\mathbb{R}^3$

The correct answer is: $\{(-2,-1,-1)^T, (-3,-3,0)^T, (2,0,2)^T\}$; $\mathbb{R}^3$

Question **24**
Correct
Mark 1.00 out of 1.00

If $v_1, v_2, \cdots, v_k$ are vectors in a vector space V, and Span$(v_1, v_2, \cdots, v_k) =$ Span$(v_1, v_2, \cdots, v_{k-1})$, then v_k can be written as alinear combination of $v_1, v_2, \cdots, v_{k-1}$

Select one:

a. True

b. False

The correct answer is: True

Question **25**
Correct
Mark 1.00 out of 1.00

If A is an $m \times n$-matrix, and columns of A are linearly independent, then

Select one:

a. $m = n$

b. $m = n + 1$

c. $m \leq n$

d. $n \leq m$

The correct answer is: $n \leq m$

Question **26**
Correct
Mark 1.00 out of 1.00

Let A be a 5×4 matrix, and rank$(A) = 4$

Select one:

a. A has a row of zeros

b. The columns of A are linearly independent

c. nullity$(A) = 1$

d. The rows of A are linearly independent

The correct answer is: The columns of A are linearly independent

Question **27**
Incorrect
Mark 0.00 out of 1.00

If A is a nonzero 4×2-matrix and $Ax = 0$ has infinitely many solutions, then rank$(A) =$

Select one:
- a. 2 ✗
- b. 4
- c. 3
- d. 1

The correct answer is: 1

Question **28**
Correct
Mark 1.00 out of 1.00

If A is a 4×3 matrix with rank$(A) = 3$, then the homogeneous system $Ax = 0$ has a nontrivial solution.

Select one:
- a. False ✓
- b. True

The correct answer is: False

Question **29**
Correct
Mark 1.00 out of 1.00

let A be a 4×7-matrix, if the row echelon form of A has 2 nonzero rows, then dim(column space of A) is

Select one:
- a. 7
- b. 5
- c. 2 ✓
- d. 3

The correct answer is: 2

Question **30**
Correct
Mark 1.00 out of 1.00

The functions $\sin x, \cos x, \sin(2x)$ in $C^2[0, 2\pi]$ are

Select one:
- a. linearly dependent
- b. linearly independent ✓

The correct answer is: linearly independent

Question **31**
Correct
Mark 1.00 out of 1.00

If A is a 3×3-matrix, and $Ax = 0$ has only the zero solution, then nullity$(A) =$

Select one:
- a. 1
- b. 3
- c. 2
- d. 0 ✓

The correct answer is: 0

Question **32**
Correct
Mark 1.00 out of 1.00

The vectors $\{(1,-1,-4)^T, (1,-1,1)^T, (1,-1,2)^T\}$ form a basis for $\mathbb{R}^3$.

Select one:
- a. False ✔
- b. True

The correct answer is: False

Jump to...

Announcements ►

Data retention summary

Started on	Sunday, 10 January 2021, 9:53 AM
State	Finished
Completed on	Sunday, 10 January 2021, 11:07 AM
Time taken	1 hour 14 mins
Grade	**25.00** out of 32.00 (**78**%)

Question **1**
Correct
Mark 1.00 out of 1.00

Let $E = [2 + x, 3 - x]$, $F = [1, x]$ be ordered bases for P_2. The transition matrix from E to F is

Select one:

a. $\begin{pmatrix} 2 & 1 \\ 3 & -1 \end{pmatrix}$

b. $\begin{pmatrix} 1 & -1 \\ 3 & 2 \end{pmatrix}$

c. $\begin{pmatrix} 1 & -1 \\ 2 & 3 \end{pmatrix}$

d. $\begin{pmatrix} 2 & 3 \\ 1 & -1 \end{pmatrix}$ ✔

The correct answer is: $\begin{pmatrix} 2 & 3 \\ 1 & -1 \end{pmatrix}$

Question **2**
Incorrect
Mark 0.00 out of 1.00

Let A be a 4×5-matrix, with $\text{rank}(A) = 3$. Then The rows of A are linearly dependent.

Select one:

a. True

b. False ✖

The correct answer is: True

Question **3**
Correct
Mark 1.00 out of 1.00

Let V be a vector space of dimension 4 and $W = \{v_1, v_2, v_3, v_4, v_5\}$ a set of nonzero vectors of V, then

Select one:

a. W is linearly dependent ✔

b. W is a basis

c. W is a spanning set

d. W is linearly independent

The correct answer is: W is linearly dependent

Question **4**
Correct
Mark 1.00 out of 1.00

Let $S = \left\{ p(x) = ax^2 + bx + c \in P_3 : \int_0^1 p(x)\,dx = 0 \right\}$. The dimension of S is.

Select one:
- a. 1
- b. 3
- c. 2 ✔
- d. 4

The correct answer is: 2

Question **5**
Correct
Mark 1.00 out of 1.00

The vectors $\{(1,-1,1)^T, (1,-3,2)^T, (1,-2,0)^T\}$ form a basis for $\mathbb{R}^3$.

Select one:
- a. False
- b. True ✔

The correct answer is: True

Question **6**
Correct
Mark 1.00 out of 1.00

Let $S = \{f \in C[-1,1] : f \text{ is an odd function } \}$, then S is a subspace of $C[-1,1]$.

Select one:
- a. True ✔
- b. False

The correct answer is: True

Question **7**
Correct
Mark 1.00 out of 1.00

Let A be a 2×4 matrix, and rank$(A) = 2$, then, the columns of A form a spanning set for $\mathbb{R}^2$.

Select one:
- a. False
- b. True ✔

The correct answer is: True

Question **8**
Correct
Mark 1.00 out of 1.00

let A be a 4×7-matrix, if the row echelon form of A has 2 nonzero rows, then dim(column space of A) is

Select one:
- a. 7
- b. 2 ✔
- c. 3
- d. 5

The correct answer is: 2

Question 9
Incorrect
Mark 0.00 out of 1.00

If A is a 3×3-matrix, and $Ax = 0$ has only the zero solution, then nullity$(A) =$

Select one:
- a. 0
- b. 3 ✗
- c. 2
- d. 1

The correct answer is: 0

Question 10
Incorrect
Mark 0.00 out of 1.00

If A is a nonzero 4×2-matrix and $Ax = 0$ has infinitely many solutions, then rank$(A) =$

Select one:
- a. 4
- b. 2 ✗
- c. 1
- d. 3

The correct answer is: 1

Question 11
Correct
Mark 1.00 out of 1.00

If A is an $n \times n$ singular matrix, then

Select one:
- a. The rows of A are linearly independent
- b. $N(A) = \{0\}$
- c. The columns of A are linearly dependent ✓
- d. rank$(A) = n$

The correct answer is: The columns of A are linearly dependent

Question 12
Correct
Mark 1.00 out of 1.00

The vectors $\{x^2 + 2x + 1, x - 1, x^2 + x + 1\}$ form a basis for P_3.

Select one:
- a. False
- b. True ✓

The correct answer is: True

Question **13**
Incorrect
Mark 0.00 out of 1.00

Let $S=\{\begin{pmatrix} a+b+2c \\ a+2c \\ a+b+2c \end{pmatrix}: a,b\in\mathbb{R}\}$. Then dimension of S equals

Select one:
- a. 1
- b. 3 ✗
- c. 2
- d. 0

The correct answer is: 2

Question **14**
Correct
Mark 1.00 out of 1.00

dimension of the subspace $S=\text{Span}\left\{A_1=\begin{pmatrix} 1 & 2 \\ 1 & 0 \end{pmatrix}, A_2\begin{pmatrix} 0 & -1 \\ 1 & 3 \end{pmatrix}, A_3=\begin{pmatrix} -3 & -8 \\ -1 & 6 \end{pmatrix}\right\}$ is

Select one:
- a. 3
- b. 2 ✓
- c. 0
- d. 1

The correct answer is: 2

Question **15**
Correct
Mark 1.00 out of 1.00

If A is an $n\times n$-matrix and for each $b\in\mathbb{R}^n$ the system $Ax=b$ has a unique solution, then

Select one:
- a. A is singular
- b. A is nonsingular ✓
- c. rank$(A)=n-1$
- d. nullity$(A)=1$

The correct answer is: A is nonsingular

Question **16**
Correct
Mark 1.00 out of 1.00

Let A be a 4×3 matrix, and nullity$(A)=0$, then

Select one:
- a. The rows of A are linearly independent
- b. the columns of A form a basis for $\mathbb{R}^4$
- c. rank$(A)=1$
- d. The columns of A are linearly independent ✓

The correct answer is: The columns of A are linearly independent

Question 17
Correct
Mark 1.00 out of 1.00

Let A be a 4×6 matrix, and nullity$(A) = 2$, then the system $Ax = b$ has infinite number of solutions for every $b \in \mathbb{R}^4$.

Select one:
- a. True ✔
- b. False

The correct answer is: True

Question 18
Correct
Mark 1.00 out of 1.00

Let V be a vector space, $v_1, v_2, \ldots v_n \in V$ be linearly independent, and $v \in V$, then the vectors $v_1, v_2, \ldots v_n, v$ are linearly independent.

Select one:
- a. False ✔
- b. True

The correct answer is: False

Question 19
Correct
Mark 1.00 out of 1.00

Let v_1, v_2 be linearly dependent in a vector space V, $V =$Span(v_1, v_2), then dim$(V) = 2$

Select one:
- a. True
- b. False ✔

The correct answer is: False

Question 20
Correct
Mark 1.00 out of 1.00

dim$\left(\text{span}(x^2, 3 + x^2, x^2 + 1)\right)$ is

Select one:
- a. 3
- b. 0
- c. 2 ✔
- d. 1

The correct answer is: 2

Question 21
Incorrect
Mark 0.00 out of 1.00

If $T_{n\times n}$ is a transition matrix between two bases for a vector space V, dim$(V) = n > 0$, then

Select one:
- a. rank$(T) = 1$ ✖
- b. nullity$(T) = n$
- c. T is nonsingular
- d. det$(T) = 1$

The correct answer is: T is nonsingular

Question 22
Incorrect
Mark 0.00 out of 1.00

If A is a 3×2 matrix, then

Select one:
- a. The columns of A are linearly independent
- b. The columns of A are linearly dependent ✗
- c. The rows of A are linearly dependent
- d. Rank$(A) = 3$

The correct answer is: The rows of A are linearly dependent

Question 23
Correct
Mark 1.00 out of 1.00

The transition matrix from the standard basis $S = \left[e_1 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}, e_2 = \begin{pmatrix} 0 \\ 1 \end{pmatrix}\right]$ to the ordered basis $U = \left[u_1 = \begin{pmatrix} 2 \\ 3 \end{pmatrix}, u_2 = \begin{pmatrix} 1 \\ 2 \end{pmatrix}\right]$ is

Select one:
- a. $T = \begin{pmatrix} 2 & 1 \\ 3 & 2 \end{pmatrix}$
- b. $T = \begin{pmatrix} 2 & -1 \\ -3 & 2 \end{pmatrix}$ ✓
- c. $T = \begin{pmatrix} -2 & 1 \\ 3 & -2 \end{pmatrix}$
- d. $T = \begin{pmatrix} 2 & 3 \\ 1 & 2 \end{pmatrix}$

The correct answer is: $T = \begin{pmatrix} 2 & -1 \\ -3 & 2 \end{pmatrix}$

Question 24
Correct
Mark 1.00 out of 1.00

Let $E = [2 + x, 1 - x, x^2 + 1]$ be an ordered basis for P_3. If $p(x) = 2x^2 + 6x + 5$, then the coordinate vector of $p(x)$ with respect to E is

Select one:
- a. $\begin{pmatrix} 2 \\ -3 \\ 3 \end{pmatrix}$
- b. $\begin{pmatrix} 3 \\ -3 \\ 2 \end{pmatrix}$ ✓
- c. $\begin{pmatrix} 3 \\ 2 \\ -3 \end{pmatrix}$
- d. $\begin{pmatrix} 3 \\ 5 \\ 4 \end{pmatrix}$

The correct answer is: $\begin{pmatrix} 3 \\ -3 \\ 2 \end{pmatrix}$

Question **25**
Correct
Mark 1.00 out of 1.00

Let A be a 3×5 matrix, and nullity$(A) = 3$, then the rows of A are linearly independent

Select one:
- a. False ✔
- b. True

The correct answer is: False

Question **26**
Correct
Mark 1.00 out of 1.00

if $\{v_1, v_2, \cdots, v_k\}$ is a spanning set for $\mathbb{R}^{3\times 2}$, then

Select one:
- a. $k = 6$
- b. $k > 6$
- c. $k \geq 6$ ✔
- d. $k \leq 6$

The correct answer is: $k \geq 6$

Question **27**
Correct
Mark 1.00 out of 1.00

If $A = \begin{pmatrix} 1 & 2 & -1 & 0 \\ -1 & -2 & 2 & 0 \\ 2 & 4 & 0 & 0 \end{pmatrix}$, then rank$(A) = 3$.

Select one:
- a. True
- b. False ✔

The correct answer is: False

Question **28**
Incorrect
Mark 0.00 out of 1.00

If A is an $m \times n$-matrix, $m \neq n$, then either the rows or the columns of A are linearly independent

Select one:
- a. False
- b. True ✖

The correct answer is: False

Question **29**
Correct
Mark 1.00 out of 1.00

Let $S = \{\begin{pmatrix} x \\ y \end{pmatrix} \in \mathbb{R}^2 : x = -y\}$, then S is a subspace of $\mathbb{R}^2$.

Select one:
- a. True ✔
- b. False

The correct answer is: True

Question **30**
Correct
Mark 1.00 out of 1.00

The coordinate vector of $8+6x$ with respect to the basis $[2, 2x]$ is $(4,3)^T$

Select one:
- a. False
- b. True

The correct answer is: True

Question **31**
Correct
Mark 1.00 out of 1.00

If $\{v_1, v_2, v_3, v_4\}$ is a basis for a vector space V , then the set $\{v_1, v_2, v_3\}$ is

Select one:
- a. linearly independent and a spanning set for V.
- b. linearly independent and not a spanning set for V.
- c. linearly dependent and not a spanning set for V.
- d. linearly dependent and a spanning set

The correct answer is: linearly independent and not a spanning set for V.

Question **32**
Correct
Mark 1.00 out of 1.00

The nullity of $A = \begin{pmatrix} 1 & 4 & 1 & 2 & 1 \\ 0 & 6 & -1 & 2 & -1 \\ 3 & 10 & 0 & 4 & 1 \end{pmatrix}$ is

Select one:
- a. 2
- b. 1
- c. 3
- d. 4

The correct answer is: 2

Jump to...

Announcements ▶

Started on	Sunday, 10 January 2021, 9:46 AM
State	Finished
Completed on	Sunday, 10 January 2021, 11:01 AM
Time taken	1 hour 14 mins
Grade	**23.00** out of 32.00 (**72**%)

Question **1**
Correct
Mark 1.00 out of 1.00

If A is an $n \times n$ singular matrix, then

Select one:
- a. The columns of A are linearly dependent ✔
- b. $N(A) = \{0\}$
- c. rank$(A) = n$
- d. The rows of A are linearly independent

The correct answer is: The columns of A are linearly dependent

Question **2**
Correct
Mark 1.00 out of 1.00

The rank of $A = \begin{pmatrix} 1 & 4 & 1 & 2 & 1 \\ 0 & 6 & -1 & 2 & -1 \\ 3 & 10 & 0 & 4 & 1 \end{pmatrix}$ is

Select one:
- a. 1
- b. 2
- c. 4
- d. 3 ✔

The correct answer is: 3

Question **3**
Incorrect
Mark 0.00 out of 1.00

If A is an $m \times n$-matrix, and columns of A are linearly independent, then

Select one:
- a. $n \leq m$
- b. $m = n$
- c. $m \leq n$ ✖
- d. $m = n + 1$

The correct answer is: $n \leq m$

Question **4**
Correct
Mark 1.00 out of 1.00

If $v_1, v_2, \cdots, v_n \in V$, dim$(V) = n$ and $v_1, v_2, \cdots, v_n$ are linearly independent, then Span $(v_1, v_2, \cdots, v_n) = V$, .

Select one:
- a. False
- b. True ✔

The correct answer is: True

Question **5**
Correct
Mark 1.00 out of 1.00

If A is a 4×3 matrix such that $N(A) = \{0\}$, and b can be written as a linear combination of the columns of A, then

Select one:
- a. The system $Ax = b$ has exactly one solution ✔
- b. The system $Ax = b$ has exactly two solutions
- c. The system $Ax = b$ is inconsistent
- d. The system $Ax = b$ has infinitely many solutions

The correct answer is: The system $Ax = b$ has exactly one solution

Question **6**
Correct
Mark 1.00 out of 1.00

Let A be a 3×5 matrix, and nullity$(A) = 2$, then the columns of A form a aspanning set for $\mathbb{R}^3$

Select one:
- a. False
- b. True ✔

The correct answer is: True

Question **7**
Incorrect
Mark 0.00 out of 1.00

Let V be a vector space, $v_1, v_2, \ldots v_n \in V$ be linearly independent, and $v \in V$, then the vectors $v_1, v_2, \ldots v_n, v$ are linearly independent.

Select one:
- a. True ✖
- b. False

The correct answer is: False

Question 8
Correct
Mark 1.00 out of 1.00

If $\{v_1, v_2, v_3, v_4\}$ is a basis for a vector space V , then the set $\{v_1, v_2, v_3\}$ is

Select one:
- a. linearly dependent and a spanning set
- b. linearly independent and a spanning set for V.
- c. linearly dependent and not a spanning set for V.
- d. linearly independent and not a spanning set for V. ✔

The correct answer is: linearly independent and not a spanning set for V.

Question 9
Correct
Mark 1.00 out of 1.00

Let $S = \left\{ \begin{pmatrix} a+b+2c \\ a+2c \\ a+b+2c \end{pmatrix} : a, b \in \mathbb{R} \right\}$. Then dimension of S equals

Select one:
- a. 3
- b. 0
- c. 1
- d. 2 ✔

The correct answer is: 2

Question 10
Correct
Mark 1.00 out of 1.00

If A is an $m \times n$-matrix, and columns of A form a spanning set for $\mathbb{R}^m$, then

Select one:
- a. $n \leq m$
- b. $m = n + 1$
- c. $m \leq n$ ✔
- d. $m = n$

The correct answer is: $m \leq n$

Question 11
Correct
Mark 1.00 out of 1.00

If $T_{n \times n}$ is a transition matrix between two bases for a vector space V, dim$(V) = n > 0$, then

Select one:
- a. nullity$(T) = n$
- b. T is nonsingular ✔
- c. rank$(T) = 1$
- d. det$(T) = 1$

The correct answer is: T is nonsingular

Question **12**
Correct
Mark 1.00 out of 1.00

If the columns of $A_{n\times n}$ are linearly independent and $b \in \mathbb{R}^n$, then the system $Ax = b$ has

Select one:
- a. exactly one solution ✔
- b. infinitely many solutions
- c. no solution
- d. exactly 2 solutions

The correct answer is: exactly one solution

Question **13**
Incorrect
Mark 0.00 out of 1.00

Let $S = \{f \in C[-1,1] : f(-1) = f(1)\}$, then S is a subspace of $C[-1,1]$.

Select one:
- a. False ✖
- b. True

The correct answer is: True

Question **14**
Correct
Mark 1.00 out of 1.00

If A is a 3×5-matrix, rows of A are linearly independent, then

Select one:
- a. rank(A) = nullity$(A) + 3$
- b. rank(A) = nullity$(A) + 2$
- c. rank(A) = nullity$(A) + 1$ ✔
- d. rank(A) = nullity(A)

The correct answer is: rank(A) = nullity$(A) + 1$

Question **15**
Correct
Mark 1.00 out of 1.00

If $A = \begin{pmatrix} 1 & -2 & -1 & 0 \\ -1 & 2 & 2 & 0 \\ 2 & -4 & 0 & 0 \end{pmatrix}$, then rank$(A) = 3$.

Select one:
- a. True
- b. False ✔

The correct answer is: False

Question **16**
Incorrect
Mark 0.00 out of 1.00

Let $S = \{\begin{pmatrix} x \\ y \end{pmatrix} \in \mathbb{R}^2 : x + y = 0\}$, then S is a subspace of $\mathbb{R}^2$.

Select one:
- a. False ✖
- b. True

The correct answer is: True

Question **17**
Incorrect
Mark 0.00 out of 1.00

The vectors $\{x - 1, 2x^2 + x + 5, x^2 + x + 2\}$ form a basis for P_3.

Select one:
- a. True ✖
- b. False

The correct answer is: False

Question **18**
Correct
Mark 1.00 out of 1.00

Every spanning set for $\mathbb{R}^3$ contains at least 3 vectors.

Select one:
- a. False
- b. True ✔

The correct answer is: True

Question **19**
Correct
Mark 1.00 out of 1.00

Let V be a vector space of dimension 4 and $W = \{v_1, v_2, v_3, v_4, v_5\}$ a set of nonzero vectors of V, then

Select one:
- a. W is linearly independent
- b. W is a spanning set
- c. W is a basis
- d. W is linearly dependent ✔

The correct answer is: W is linearly dependent

Question **20**
Incorrect
Mark 0.00 out of 1.00

Let $E = [2+x, 1-x, x^2+1]$ be an ordered basis for P_3. If $p(x) = 2x^2+6x+5$, then the coordinate vector of $p(x)$ with respect to E is

Select one:

a. $\begin{pmatrix} 3 \\ -3 \\ 2 \end{pmatrix}$

b. $\begin{pmatrix} 2 \\ -3 \\ 3 \end{pmatrix}$ ✖

c. $\begin{pmatrix} 3 \\ 2 \\ -3 \end{pmatrix}$

d. $\begin{pmatrix} 3 \\ 5 \\ 4 \end{pmatrix}$

The correct answer is: $\begin{pmatrix} 3 \\ -3 \\ 2 \end{pmatrix}$

Question **21**
Incorrect
Mark 0.00 out of 1.00

The coordinate vector of $8+6x$ with respect to the basis $[2, 2x]$ is $(4,3)^T$

Select one:

a. True

b. False ✖

The correct answer is: True

Question **22**
Incorrect
Mark 0.00 out of 1.00

Let A be a 5×4 matrix, and rank$(A) = 4$

Select one:

a. A has a row of zeros ✖

b. The columns of A are linearly independent

c. The rows of A are linearly independent

d. nullity$(A) = 1$

The correct answer is: The columns of A are linearly independent

Question **23**
Correct
Mark 1.00 out of 1.00

The vectors $\{(1,-1,1)^T, (1,-3,2)^T, (1,-2,0)^T\}$ form a basis for $\mathbb{R}^3$.

Select one:

a. False

b. True ✔

The correct answer is: True

Question **24**
Correct
Mark 1.00 out of 1.00

dimension of the subspace $S = \text{Span}\left\{A_1 = \begin{pmatrix} 0 & 2 \\ 1 & 1 \end{pmatrix}, A_2 \begin{pmatrix} 3 & -1 \\ 1 & 0 \end{pmatrix}, A_3 = \begin{pmatrix} 6 & -8 \\ -1 & -3 \end{pmatrix}\right\}$ is

Select one:
- a. 3
- b. 1
- c. 2 ✔
- d. 0

The correct answer is: 2

Question **25**
Correct
Mark 1.00 out of 1.00

If A is a 4×6 matrix, then nullity of $A \geq 2$.

Select one:
- a. False
- b. True ✔

The correct answer is: True

Question **26**
Correct
Mark 1.00 out of 1.00

If $v_1, v_2, \cdots, v_k$ are vectors in a vector space V, and Span$(v_1, v_2, \cdots, v_k) =$ Span$(v_1, v_2, \cdots, v_{k-1})$, then v_k can be written as alinear combination of $v_1, v_2, \cdots, v_{k-1}$

Select one:
- a. False
- b. True ✔

The correct answer is: True

Question **27**
Incorrect
Mark 0.00 out of 1.00

Let $E = [3 - x, 2 + x]$, $F = [1, x]$ be ordered bases for P_2. The transition matrix from E to F is

Select one:
- a. $\begin{pmatrix} 1 & 2 \\ -1 & 3 \end{pmatrix}$
- b. $\begin{pmatrix} 3 & 2 \\ -1 & 1 \end{pmatrix}$
- c. $\begin{pmatrix} -1 & 1 \\ 2 & 3 \end{pmatrix}$ ✖
- d. $\begin{pmatrix} -1 & 1 \\ 3 & 2 \end{pmatrix}$

The correct answer is: $\begin{pmatrix} 3 & 2 \\ -1 & 1 \end{pmatrix}$

Question **28**
Correct
Mark 1.00 out of 1.00

If A is a nonzero 4×2-matrix and $Ax = 0$ has infinitely many solutions, then rank$(A) =$

Select one:

- a. 1 ✔
- b. 4
- c. 3
- d. 2

The correct answer is: 1

Question **29**
Correct
Mark 1.00 out of 1.00

The transition matrix from the standard basis $S = \left[e_1 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}, e_2 = \begin{pmatrix} 0 \\ 1 \end{pmatrix}\right]$ to the ordered basis $U = \left[u_1 = \begin{pmatrix} 1 \\ 2 \end{pmatrix}, u_2 = \begin{pmatrix} 3 \\ 7 \end{pmatrix}\right]$ is

Select one:

- a. $T = \begin{pmatrix} 1 & 3 \\ 2 & 7 \end{pmatrix}$
- b. $T = \begin{pmatrix} 1 & -3 \\ -2 & 7 \end{pmatrix}$
- c. $T = \begin{pmatrix} 7 & -3 \\ -2 & 1 \end{pmatrix}$ ✔
- d. $T = \begin{pmatrix} -7 & 3 \\ 2 & -1 \end{pmatrix}$

The correct answer is: $T = \begin{pmatrix} 7 & -3 \\ -2 & 1 \end{pmatrix}$

Question **30**
Correct
Mark 1.00 out of 1.00

Let $S = \left\{p(x) = ax^2 + bx + c \in P_3 : \int_0^1 p(x)\, dx = 0\right\}$. The dimension of S is.

Select one:

- a. 4
- b. 3
- c. 1
- d. 2 ✔

The correct answer is: 2

Question **31**
Correct
Mark 1.00 out of 1.00

Let A be a 4×3 matrix, and nullity$(A) = 0$, then

Select one:
- a. the columns of A form a basis for $\mathbb{R}^4$
- b. The rows of A are linearly independent
- c. The columns of A are linearly independent ✔
- d. rank$(A) = 1$

The correct answer is: The columns of A are linearly independent

Question **32**
Correct
Mark 1.00 out of 1.00

Let V be a vector space, $v_1, v_2, v_3 \in V$ such that v_1, v_2 are linearly independent, v_2, v_3 are linearly independent, and v_1, v_3 are linearly independent, then v_1, v_2, v_3 are linearly independent.

Select one:
- a. False ✔
- b. True

The correct answer is: False

Jump to...

Announcements ►

Data retention summary

Started on	Tuesday, 15 December 2020, 8:30 AM
State	Finished
Completed on	Tuesday, 15 December 2020, 8:43 AM
Time taken	12 mins 54 secs
Grade	**6.00** out of 6.00 (**100**%)

Question **1**

Correct

Mark 1.00 out of 1.00

If $f_1, f_2, \cdots, f_n \in C^{n-1}[a, b]$ and $W[f_1, f_2, \cdots, f_n](x) \neq 0$ for all $x \in [a, b]$, then $f_1, f_2, \cdots, f_n$ are

Select one:

a. form a spanning set for $C^{n-1}[a, b]$

b. linearly independent. ✔

c. linearly dependent.

The correct answer is: linearly independent.

Question **2**

Correct

Mark 1.00 out of 1.00

The vectors $\{(1, -1, 1)^T, (1, -3, 2)^T, (1, -2, 0)^T\}$ in $\mathbb{R}^3$ are

Select one:

a. linearly dependent

b. linearly independent ✔

The correct answer is: linearly independent

Question **3**

Correct

Mark 1.00 out of 1.00

The set $S = \left\{ \begin{pmatrix} x \\ y \\ x+y+2z \end{pmatrix} : x, y, z \in \mathbb{R} \right\}$ is a subspace of $\mathbb{R}^3$

Select one:

a. True ✔

b. False

The correct answer is: True

Question **4**

Correct

Mark 1.00 out of 1.00

Let $S = \{ \begin{pmatrix} a+b \\ a \\ a+b \end{pmatrix} : a, b \in \mathbb{R}\}$. Then dimension of S equals

Select one:

a. 2 ✔

b. 3

c. 1

d. 0

The correct answer is: 2

Question **5**

Correct

Mark 1.00 out of 1.00

If $v_1, v_2, \cdots, v_n$ are linearly independent vectors in a vector space V, and $c_1v_1 + c_2v_2 + \cdots + c_nv_n = 0$, then $c_1, c_2, \cdots, c_n$ are all zero scalars.

Select one:

- a. True ✔
- b. False

The correct answer is: True

Question **6**

Correct

Mark 1.00 out of 1.00

If $\{v_1, v_2, v_3, v_4\}$ forms a spanning set for a vector space V, v_4 can be written as a linear combination of v_1, v_2, v_3, then

Select one:

- a. $\{v_1, v_2, v_3\}$ are linearly dependent in V.
- b. $\{v_1, v_2, v_3\}$ are linearly independent in V.
- c. $\{v_1, v_2, v_3\}$ is a spanning set of V. ✔
- d. $\{v_1, v_2, v_3\}$ is not a spanning set of V.

The correct answer is: $\{v_1, v_2, v_3\}$ is a spanning set of V.

Started on	Wednesday, 23 December 2020, 10:01 AM
State	Finished
Completed on	Wednesday, 23 December 2020, 10:20 AM
Time taken	18 mins 19 secs
Marks	8.00/18.00
Grade	**4.44** out of 10.00 (**44**%)

Question **1**
Incorrect
Mark 0.00 out of 2.00

dim(span$\{1-x, x^2, 3+x^2, 1+x^2\}$) equals

Select one:

- a. 0
- b. 3
- c. 1
- d. 2 ✖

The correct answer is: 3

Question **2**
Correct
Mark 2.00 out of 2.00

One of the following is not a basis for P_3:

Select one:

- a. $\{1, 2x, x^2-x\}$
- b. $\{x, x^2+3, x^2-5\}$
- c. $\{x-1, x^2+1, x^2-1\}$
- d. $\{x^2+1, x^2-1, 2\}$ ✔

The correct answer is: $\{x^2+1, x^2-1, 2\}$

Question **3**
Correct
Mark 2.00 out of 2.00

If V is a vector space with dim$(V)=n$, then

Select one:

- a. Any set containing less than n vectors must be linearly independent.
- b. Any n linearly independent vectors in V span V. ✔
- c. Any spanning set for V must contain at most n vectors.

The correct answer is: Any n linearly independent vectors in V span V.

Question **4**
Incorrect
Mark 0.00 out of 2.00

The set of vectors $\{(1,a)^T,(b,1)^T\}$ is a spanning set for R^2 if

Select one:
- a. $a \neq b$ ✖
- b. $ab \neq 1$
- c. $ab = 1$
- d. $a \neq 1$ and $b \neq 1$

The correct answer is: $ab \neq 1$

Question **5**
Incorrect
Mark 0.00 out of 2.00

Suppose that a vector space V contains n linearly independent vectors, then

Select one:
- a. Any n vectors in V are linearly independent
- b. If a set S spans V then S must contain at most n vectors
- c. Any set containing more than n vectors is linearly dependent ✖
- d. If a set S spans V then S must contain at least n vectors

The correct answer is: If a set S spans V then S must contain at least n vectors

Question **6**
Correct
Mark 2.00 out of 2.00

Let $f,g,h \in C^2[a,b]$, if $W[f,g,h](x)=0$ for all $x \in [a,b]$, then f,g,h are linearly dependent in $C[a,b]$

Select one:
- a. True
- b. False ✔

The correct answer is: False

Question **7**
Complete
Not graded

Let V is a vector space with dim$(V)=4$, if $v_1,v_2,v_3,v_4 \in V$, then span $\{v_1,v_2,v_3,v_4\}=V$.

Select one:
- a. False
- b. True

The correct answer is: False

Question **8**
Incorrect
Mark 0.00 out of 2.00

The vectors e^x, xe^x, x are linearly independent in $C[0,1]$.

Select one:
- a. True
- b. False ✖

The correct answer is: True

Question 9
Correct
Mark 2.00 out of 2.00

If V is a vector space with dim$(V) = n$, then any $n+1$ vectors in V are linearly dependent.

Select one:
- a. True ✔
- b. False

The correct answer is: True

Question 10
Incorrect
Mark 0.00 out of 2.00

If $\{v_1, v_2, \cdots, v_n\}$ are linearly independent in a vector space V, then V is finite-dimensional.

Select one:
- a. True ✖
- b. False

The correct answer is: False

Question 11
Complete
Not graded

If x_1 and x_2 are linearly independent in R^3, then $\exists x \in R^3$ such that span$\{x_1, x_2, x\} = R^3$.

Select one:
- a. True
- b. False

The correct answer is: True

Started on	Tuesday, 24 November 2020, 3:50 PM
State	Finished
Completed on	Tuesday, 24 November 2020, 4:53 PM
Time taken	1 hour 2 mins
Grade	**28.00** out of 30.00 (**93**%)

Question **1**
Correct
Mark 1.00 out of 1.00

An $n \times n$ matrix A is invertible if and only if

Select one:
- a. $|A| = 0$
- b. $Ax = 0$ has a nonzero solution
- c. $A = I$
- d. there exists a matrix B such that $AB = I$ ✔

The correct answer is: there exists a matrix B such that $AB = I$

Question **2**
Correct
Mark 1.00 out of 1.00

$(0,0,0)^T$ is a linear combination of the vectors $(1,2,3)^T, (1,4,1)^T, (2,3,1)^T$

Select one:
- a. True ✔
- b. False

The correct answer is: True

Question **3**
Correct
Mark 1.00 out of 1.00

In the $n \times n$-linear system $Ax = b$, if A is singular and b is a linear combination of the columns of A then the system has

Select one:
- a. exactly two solutions
- b. no solution
- c. a unique solution
- d. infinitely many solutions ✔

The correct answer is: infinitely many solutions

Question **4**
Correct
Mark 1.00 out of 1.00

If y, z are solutions to $Ax = b$, then $y + z$ is a solution of the system $Ax = 0$.

Select one:
- a. True
- b. False ✔

The correct answer is: False

Question **5**
Incorrect
Mark 0.00 out of 1.00

Any two $n \times n$-singular matrices are row equivalent.

Select one:
- a. False
- b. True ✖

The correct answer is: False

Question **6**
Correct
Mark 1.00 out of 1.00

If A is a 4×3-matrix, $b \in \mathbb{R}^4$, and the system $Ax = b$ is consistent, then $Ax = b$ has a unique solution.

Select one:
- a. True
- b. False ✔

The correct answer is: False

Question **7**
Correct
Mark 1.00 out of 1.00

If $(A|b) = \begin{pmatrix} 1 & 2 & -1 & | & 0 \\ 2 & 3 & 1 & | & -1 \\ 1 & 1 & \alpha & | & \beta \end{pmatrix}$, then the system has only one solution if

Select one:
- a. $\alpha \neq 2$ and β any number ✔
- b. $\alpha \neq 2$ and $\beta \neq -1$
- c. $\alpha = 2$ and $\beta = -1$
- d. $\alpha = 2$ and $\beta \neq -1$

The correct answer is: $\alpha \neq 2$ and β any number

Question **8**
Correct
Mark 1.00 out of 1.00

If A is a nonsingular 3×3-matrix, then the reduced row echelon form of A has no row of zeros.

Select one:
- a. False
- b. True ✔

The correct answer is: True

Question **9**
Correct
Mark 1.00 out of 1.00

If E is an elementary matrix then one of the following statements is not true

Select one:
- a. E^{-1} is an elementary matrix.
- b. E is nonsingular.
- c. E^T is an elementary matrix.
- d. $E + E^T$ is an elementary matrix. ✔

The correct answer is: $E + E^T$ is an elementary matrix.

Question 10
Correct
Mark 1.00 out of 1.00

If A is a 3×3 matrix with $\det(A) = -2$. Then $\det(adj(A)) =$

Select one:
- a. 4.
- b. -4.
- c. -8.
- d. 8.

The correct answer is: 4.

Question 11
Correct
Mark 1.00 out of 1.00

If A is singular and B is nonsingular $n \times n$-matrices, then AB is

Select one:
- a. singular
- b. may or may not be singular
- c. nonsingular

The correct answer is: singular

Question 12
Correct
Mark 1.00 out of 1.00

If $(A|b) = \begin{pmatrix} 1 & 1 & 2 & | & 4 \\ 2 & -1 & 2 & | & 6 \\ 1 & 1 & 2 & | & 5 \end{pmatrix}$, then the system $Ax = b$ is inconsistent

Select one:
- a. True
- b. False

The correct answer is: True

Question 13
Correct
Mark 1.00 out of 1.00

If A is a singular $n \times n$-matrix, $b \in \mathbb{R}^n$, then the system $Ax = b$

Select one:
- a. has either no solution or an infinite number of solutions
- b. has infinitely many solutions.
- c. has a unique solution
- d. is inconsistent

The correct answer is: has either no solution or an infinite number of solutions

Question 14
Correct
Mark 1.00 out of 1.00

If A is symmetric and skew symmetric then $A = 0$. (A is skew symmetric if $A = -A^T$).

Select one:
- a. True
- b. False

The correct answer is: True

Question **15**

Correct

Mark 1.00 out of 1.00

If $A = LU$ is the LU-factorization of a matrix A, and A is singular, then

Select one:

- a. L and U are both singular
- b. U is singular and L is nonsigular ✔
- c. L and U are both nonsingular
- d. L is singular and U is nonsigular

The correct answer is: U is singular and L is nonsigular

Question **16**

Correct

Mark 1.00 out of 1.00

If A and B are singular matrices, then $A + B$ is also singular.

Select one:

- a. False ✔
- b. True

The correct answer is: False

Question **17**

Correct

Mark 1.00 out of 1.00

If A is a singular matrix, then A can be written as a product of elementary matrices.

Select one:

- a. False ✔
- b. True

The correct answer is: False

Question **18**

Correct

Mark 1.00 out of 1.00

Let $(1, 2, 0)^T$ and $(2, 1, 1)^T$ be the first two columns of a 3×3 matrix A and $(1, 1, 1)^T$ be a solution of the system $Ax = (4, 4, 5)^T$. Then the third column of the matrix A is

Select one:

- a. $(1, 1, 4)^T$. ✔
- b. $(4, -1, 1)^T$.
- c. $(-1, -1, -4)^T$.
- d. $(-1, -2, 1)^T$.

The correct answer is: $(1, 1, 4)^T$.

Question **19**

Correct

Mark 1.00 out of 1.00

Let A be a 3×4 matrix which has a row of zeros, and let B be a 4×4 matrix , then AB has a row of zeros.

Select one:

- a. True ✔
- b. False

The correct answer is: True

Question **20**

Correct

Mark 1.00 out of 1.00

Let A be a 4×4-matrix such that $A \begin{bmatrix} 1 \\ 2 \\ 3 \\ 4 \end{bmatrix} = \begin{bmatrix} 0 \\ 0 \\ 0 \\ 0 \end{bmatrix}$, then

Select one:

- a. There are elementary matrices $E_1, E_2, \cdots, E_k$ such that $A = E_1 E_2 \cdots E_k$
- b. A is the zero matrix
- c. The system $Ax = 0$ has only one solution
- d. A is singular. ✔

The correct answer is: A is singular.

Question **21**

Correct

Mark 1.00 out of 1.00

If E is an elementary matrix of type III, then E^T is

Select one:

- a. an elementary matrix of type I
- b. an elementary matrix of type II
- c. not an elementary matrix
- d. an elementary matrix of type III ✔

The correct answer is: an elementary matrix of type III

Question **22**

Correct

Mark 1.00 out of 1.00

Let $A = \begin{pmatrix} 1 & -1 & 1 \\ 3 & -2 & 2 \\ -2 & -1 & 3 \end{pmatrix}$, then $\det(A) =$

Select one:

- a. 2 ✔
- b. 3
- c. 5
- d. 0

The correct answer is: 2

Question **23**

Correct

Mark 1.00 out of 1.00

If the row echelon form of $(A|b)$ is $\begin{pmatrix} 1 & 0 & -2 & -1 & | & -2 \\ 0 & 1 & 1 & -1 & | & -1 \\ 0 & 0 & 1 & 1 & | & 0 \end{pmatrix}$ then the general form of the solutions is given by

Select one:

- a. $x = \begin{pmatrix} -2-\alpha \\ 1-\alpha \\ \alpha \\ \alpha \end{pmatrix}$
- b. $x = \begin{pmatrix} -2-\alpha \\ 1-\alpha \\ \alpha \\ 1 \end{pmatrix}$
- c. $x = \begin{pmatrix} -2-\alpha \\ -1+2\alpha \\ -\alpha \\ \alpha \end{pmatrix}$ ✔
- d. $x = \begin{pmatrix} \alpha \\ 2-\alpha \\ \alpha \\ \alpha \end{pmatrix}$

The correct answer is: $x = \begin{pmatrix} -2-\alpha \\ -1+2\alpha \\ -\alpha \\ \alpha \end{pmatrix}$

Question **24**

Correct

Mark 1.00 out of 1.00

If A, B are $n \times n$-skew-symmetric matrices(A is skew symmetric if $A^T = -A$), then $AB + BA$ is symmetric

Select one:

- a. True ✔
- b. False

The correct answer is: True

Question **25**

Correct

Mark 1.00 out of 1.00

Let A be a 4×3-matrix with $a_2 - a_3 = 0$. If $b = a_1 + a_2 + a_3$, where a_j is the jth column of A, then the system $Ax = b$ will have infinitely many solutions.

Select one:

- a. False
- b. True ✔

The correct answer is: True

Question **26**

Correct

Mark 1.00 out of 1.00

If A is a 3×3-matrix and the system $Ax = \begin{pmatrix} 5 \\ 1 \\ 3 \end{pmatrix}$ has a unique solution, then the system $Ax = \begin{pmatrix} 0 \\ 0 \\ 0 \end{pmatrix}$

Select one:

- a. is inconsistent
- b. has only the zero solution. ✔
- c. has infinitely many solutions

The correct answer is: has only the zero solution.

Question **27**

Incorrect

Mark 0.00 out of 1.00

If $AB = 0$, where A and B are $n \times n$ nonzero matrices. Then

Select one:

- a. either A or B is singular ✖
- b. both A, B are singular.
- c. both A, B are nonsingular.
- d. either $A = 0$ or $B = 0$

The correct answer is: both A, B are singular.

Question **28**

Correct

Mark 1.00 out of 1.00

If x_0 is a solution of the nonhomogeneous system $Ax = b$ and x_1 is a solution of the homogeneous system $Ax = 0$. Then $x_1 + x_0$ is a solution of

Select one:

- a. the system $Ax = 0$
- b. the system $Ax = 2b$
- c. the system $Ax = Ab$
- d. the system $Ax = b$ ✔

The correct answer is: the system $Ax = b$

Question **29**

Correct

Mark 1.00 out of 1.00

If A is a nonsingular $n \times n$ matrix, $b \in \mathbb{R}^n$, then

Select one:

- a. The system $Ax = b$ is inconsistent
- b. The system $Ax = b$ has only two solutions
- c. The system $Ax = b$ has a unique solution ✔
- d. The system $Ax = b$ has infinitely many solutions

The correct answer is: The system $Ax = b$ has a unique solution

Question 30

Correct

Mark 1.00 out of 1.00

The adjoint of the matrix $\begin{pmatrix} -1 & 2 \\ 1 & 3 \end{pmatrix}$ is

Select one:

a. $\begin{pmatrix} -1 & 1 \\ 2 & -3 \end{pmatrix}$

b. $\begin{pmatrix} 1 & -2 \\ -1 & -3 \end{pmatrix}$

c. $\begin{pmatrix} 3 & -2 \\ -1 & -1 \end{pmatrix}$ ✔

d. $\begin{pmatrix} 1 & 1 \\ 2 & 3 \end{pmatrix}$

The correct answer is: $\begin{pmatrix} 3 & -2 \\ -1 & -1 \end{pmatrix}$

Started on	Tuesday, 24 November 2020, 3:51 PM
State	Finished
Completed on	Tuesday, 24 November 2020, 4:48 PM
Time taken	57 mins 9 secs
Grade	**28.00** out of 30.00 (**93**%)

Question **1**

Correct

Mark 1.00 out of 1.00

Let $A = \begin{pmatrix} 1 & -1 & 1 \\ 3 & -2 & 2 \\ -2 & 4 & 3 \end{pmatrix}$, then $\det(A) =$

Select one:

a. 0

b. 9

c. 5

d. 7 ✔

The correct answer is: 7

Question **2**

Correct

Mark 1.00 out of 1.00

If A is a 2×3-matrix, and $b = a_2$ (second column of A), then a solution to the system $Ax = b$ is

Select one:

a. $x = \begin{pmatrix} 1 \\ 0 \\ 0 \\ 0 \end{pmatrix}$

b. $x = \begin{pmatrix} 1 \\ 0 \\ 0 \end{pmatrix}$

c. $x = \begin{pmatrix} 0 \\ 1 \\ 0 \\ 0 \end{pmatrix}$

d. $x = \begin{pmatrix} 0 \\ 1 \\ 0 \end{pmatrix}$ ✔

The correct answer is: $x = \begin{pmatrix} 0 \\ 1 \\ 0 \end{pmatrix}$

Question **3**

Correct

Mark 1.00 out of 1.00

If A is a 2×2 matrix with $\det(A) = -2$. Then $\det(adj(A)) =$

Select one:

- a. 2.
- b. -2. ✔
- c. -4.
- d. 4.

The correct answer is: -2.

Question **4**

Correct

Mark 1.00 out of 1.00

If A, B, C are $n \times n$ nonsingular matrices, then $A^2 - B^2 = (A + B)(A - B)$.

Select one:

- a. False ✔
- b. True

The correct answer is: False

Question **5**

Correct

Mark 1.00 out of 1.00

If A is a singular matrix, then A can be written as a product of elementary matrices.

Select one:

- a. False ✔
- b. True

The correct answer is: False

Question **6**

Correct

Mark 1.00 out of 1.00

The adjoint of the matrix $\begin{pmatrix} 5 & 2 \\ -1 & 6 \end{pmatrix}$ is

Select one:

- a. $\begin{pmatrix} 5 & -1 \\ 2 & 6 \end{pmatrix}$
- b. $\begin{pmatrix} 6 & -2 \\ 1 & 5 \end{pmatrix}$ ✔
- c. $\begin{pmatrix} -5 & -1 \\ 2 & -6 \end{pmatrix}$
- d. $\begin{pmatrix} -6 & 2 \\ -1 & -5 \end{pmatrix}$

The correct answer is: $\begin{pmatrix} 6 & -2 \\ 1 & 5 \end{pmatrix}$

Question 7
Correct
Mark 1.00 out of 1.00

If A and B are $n \times n$ matrices such that $Ax \neq Bx$ for all nonzero $x \in \mathbb{R}^n$. Then

Select one:
- a. A and B are singular.
- b. $A - B$ is singular.
- c. A and B are nonsingular.
- d. $A - B$ is nonsingular.

The correct answer is: $A - B$ is nonsingular.

Question 8
Incorrect
Mark 0.00 out of 1.00

If y, z are solutions to $Ax = b$, then $\frac{1}{3}y + \frac{3}{4}z$ is a solution of the system $Ax = b$.

Select one:
- a. False
- b. True

The correct answer is: False

Question 9
Correct
Mark 1.00 out of 1.00

Let A be a 4×4-matrix such that $A \begin{bmatrix} 1 \\ 2 \\ 3 \\ 4 \end{bmatrix} = \begin{bmatrix} 0 \\ 0 \\ 0 \\ 0 \end{bmatrix}$, then

Select one:
- a. There are elementary matrices $E_1, E_2, \cdots, E_k$ such that $A = E_1 E_2 \cdots E_k$
- b. The system $Ax = 0$ has only one solution
- c. A is singular.
- d. A is the zero matrix

The correct answer is: A is singular.

Question 10
Correct
Mark 1.00 out of 1.00

If A is symmetric and skew symmetric then $A = 0$. (A is skew symmetric if $A = -A^T$).

Select one:
- a. False
- b. True

The correct answer is: True

Question 11
Correct
Mark 1.00 out of 1.00

An $n \times n$ matrix A is invertible if and only if

Select one:
- a. there exists a matrix B such that $AB = I$ ✔
- b. $A = I$
- c. $|A| = 0$
- d. $Ax = 0$ has a nonzero solution

The correct answer is: there exists a matrix B such that $AB = I$

Question 12
Correct
Mark 1.00 out of 1.00

If A, B, C are $n \times n$-matrices with A nonsigular and $AB = AC$, then $B = C$

Select one:
- a. False
- b. True ✔

The correct answer is: True

Question 13
Correct
Mark 1.00 out of 1.00

In the square linear system $Ax = b$, if A is singular and b is not a linear combination of the columns of A then the system

Select one:
- a. has a unique solution
- b. has infinitely many solutions
- c. can not tell
- d. has no solution ✔

The correct answer is: has no solution

Question 14
Correct
Mark 1.00 out of 1.00

Any two $n \times n$-singular matrices are row equivalent.

Select one:
- a. False ✔
- b. True

The correct answer is: False

Question 15
Correct
Mark 1.00 out of 1.00

If A is a singular $n \times n$-matrix, $b \in \mathbb{R}^n$, then the system $Ax = b$

Select one:
- a. is inconsistent
- b. has a unique solution
- c. has either no solution or an infinite number of solutions ✔
- d. has infinitely many solutions.

The correct answer is: has either no solution or an infinite number of solutions

Question **16**

Correct

Mark 1.00 out of 1.00

Let A be a 3×4 matrix which has a row of zeros, and let B be a 4×4 matrix , then AB has a row of zeros.

Select one:

- a. True ✔
- b. False

The correct answer is: True

Question **17**

Correct

Mark 1.00 out of 1.00

If E is an elementary matrix of type III, then E^T is

Select one:

- a. an elementary matrix of type II
- b. an elementary matrix of type I
- c. an elementary matrix of type III ✔
- d. not an elementary matrix

The correct answer is: an elementary matrix of type III

Question **18**

Correct

Mark 1.00 out of 1.00

If the row echelon form of $(A|b)$ is $\begin{pmatrix} 1 & 0 & -2 & -1 & | & -2 \\ 0 & 1 & 1 & -1 & | & -1 \\ 0 & 0 & 1 & 1 & | & 0 \end{pmatrix}$ then the general form of the solutions is given by

Select one:

- a. $x = \begin{pmatrix} -2-\alpha \\ 1-\alpha \\ \alpha \\ \alpha \end{pmatrix}$
- b. $x = \begin{pmatrix} -2-\alpha \\ 1-\alpha \\ \alpha \\ 1 \end{pmatrix}$
- c. $x = \begin{pmatrix} -2-\alpha \\ -1+2\alpha \\ -\alpha \\ \alpha \end{pmatrix}$ ✔
- d. $x = \begin{pmatrix} \alpha \\ 2-\alpha \\ \alpha \\ \alpha \end{pmatrix}$

The correct answer is: $x = \begin{pmatrix} -2-\alpha \\ -1+2\alpha \\ -\alpha \\ \alpha \end{pmatrix}$

Question **19**

Incorrect

Mark 0.00 out of 1.00

If $(A|b) = \begin{pmatrix} 1 & 1 & 2 & | & 4 \\ 2 & -1 & 2 & | & 6 \\ 0 & 3 & 2 & | & 1 \end{pmatrix}$ is the augmented matrix of the system $Ax = b$ then the system has no solution

Select one:

- a. False ✖
- b. True

The correct answer is: True

Question **20**

Correct

Mark 1.00 out of 1.00

If $(A|b) = \begin{pmatrix} 1 & 2 & -1 & | & 0 \\ 2 & 3 & 1 & | & -1 \\ 1 & 1 & \alpha & | & \beta \end{pmatrix}$, then the system is inconsistent if

Select one:

- a. $\alpha \neq 2$ and $\beta \neq -1$
- b. $\alpha \neq 2$ and β any number
- c. $\alpha = 2$ and $\beta = -1$
- d. $\alpha = 2$ and $\beta \neq -1$ ✔

The correct answer is: $\alpha = 2$ and $\beta \neq -1$

Question **21**

Correct

Mark 1.00 out of 1.00

Let $(1, 2, 0)^T$ and $(2, 1, 1)^T$ be the first two columns of a 3×3 matrix A and $(1, 1, 1)^T$ be a solution of the system $Ax = (5, 2, 4)^T$. Then the third column of the matrix A is

Select one:

- a. $(-2, 1, -3)^T$.
- b. $(1, -1, -4)^T$.
- c. $(2, -1, 3)^T$. ✔
- d. $(1, -1, 4)^T$.

The correct answer is: $(2, -1, 3)^T$.

Question **22**

Correct

Mark 1.00 out of 1.00

If A is a nonsingular $n \times n$ matrix, then

Select one:

- a. There are elementary matrices $E_1, E_2, \cdots, E_k$ such that $A = E_1 E_2 \cdots E_k$. ✔
- b. $\det(A) = 1$
- c. There is a singular matrix C such that $A = CI$.
- d. The system $Ax = 0$ has a nontrivial (nonzero) solution.

The correct answer is: There are elementary matrices $E_1, E_2, \cdots, E_k$ such that $A = E_1 E_2 \cdots E_k$.

Question 23
Correct
Mark 1.00 out of 1.00

If A is a symmetric $n \times n$-matrix and P any $n \times n$-matrix, then PAP^T is

Select one:
- a. symmetric ✔
- b. not defined
- c. singular
- d. not symmetric

The correct answer is: symmetric

Question 24
Correct
Mark 1.00 out of 1.00

If A is an $n \times n$ matrix and the system $Ax = b$ has infinitely many solutions, then

Select one:
- a. A is symmetric
- b. A has a row of zeros
- c. A singular ✔
- d. A is nonsingular

The correct answer is: A singular

Question 25
Correct
Mark 1.00 out of 1.00

If A is a 3×3 matrix such that $det(A) = 2$, then $\det(3A) = 6$

Select one:
- a. False ✔
- b. True

The correct answer is: False

Question 26
Correct
Mark 1.00 out of 1.00

If A, B, C are 3×3-matrices, $\det(A) = 9, \det(B) = 2, \det(C) = 3$, then $\det(3C^T BA^{-1}) =$

Select one:
- a. 6
- b. 18 ✔
- c. 16
- d. 2

The correct answer is: 18

Question 27
Correct
Mark 1.00 out of 1.00

If A and B are singular matrices, then $A + B$ is also singular.

Select one:
- a. False ✔
- b. True

The correct answer is: False

Question 28
Correct
Mark 1.00 out of 1.00

In the $n \times n$-linear system $Ax = b$, if A is singular and b is a linear combination of the columns of A then the system has

Select one:
- a. no solution
- b. a unique solution
- c. infinitely many solutions ✔
- d. exactly two solutions

The correct answer is: infinitely many solutions

Question 29
Correct
Mark 1.00 out of 1.00

If A is a 4×3-matrix, $b \in \mathbb{R}^4$, and the system $Ax = b$ is consistent, then $Ax = b$ has a unique solution.

Select one:
- a. False ✔
- b. True

The correct answer is: False

Da
Sy

Question 30
Correct
Mark 1.00 out of 1.00

If A is a 3×3-matrix and the system $Ax = \begin{pmatrix} 5 \\ 1 \\ 3 \end{pmatrix}$ has a unique solution, then the system $Ax = \begin{pmatrix} 0 \\ 0 \\ 0 \end{pmatrix}$

Select one:
- a. has infinitely many solutions
- b. has only the zero solution. ✔
- c. is inconsistent

The correct answer is: has only the zero solution.

Question 1

Incorrect

Mark 0.00 out of 1.00

If A is a 4×3-matrix, $b\in\mathbb{R}^4$, and the system $Ax=b$ is consistent, then $Ax=b$ has a unique solution.

Select one:

a. False

b. True ✖

The correct answer is: False

Question 2

Incorrect

Mark 0.00 out of 1.00

If A is a singular matrix, then the system $Ax=b$ has infinite number of solutions

Select one:

a. True ✖

b. False

The correct answer is: False

α

Question **4**

Correct

Mark 1.00 out of 1.00

If $(A|b) = \begin{pmatrix} 1 & 2 & -1 & | & 0 \\ 2 & 3 & 1 & | & -1 \\ 1 & 1 & \alpha & | & \beta \end{pmatrix}$, then the system has infinite number of solutions if

Select one:

- a. $\alpha \neq 2$ and β any number
- b. $\alpha = 2$ and $\beta \neq -1$
- c. $\alpha = 2$ and $\beta = -1$ ✔
- d. $\alpha \neq 2$ and $\beta \neq -1$

The correct answer is: $\alpha = 2$ and $\beta = -1$

Question **5**

Correct

Mark 1.00 out of 1.00

Let $A = \begin{pmatrix} 1 & -1 & 1 \\ 3 & -2 & 2 \\ -2 & 1 & 3 \end{pmatrix}$, then $\det(A) =$

Select one:

- a. 4 ✔
- b. 0
- c. 8
- d. 1

The correct answer is: 4

Question **6**

Correct

Mark 1.00 out of 1.00

If $(A|b) = \begin{pmatrix} 1 & 1 & 2 & | & 4 \\ 2 & -1 & 2 & | & 6 \\ 1 & 1 & 2 & | & 5 \end{pmatrix}$, then the system $Ax = b$ is inconsistent

Select one:

- a. False
- b. True ✔

The correct answer is: True

Question **7**

Incorrect

Mark 0.00 out of 1.00

If a matrix B is obtained from A by multiplying a row of A by a real number c, then $|A| = c|B|$.

Select one:

- a. False
- b. True ✖

The correct answer is: False

Question **8**

Incorrect

Mark 0.00 out of 1.00

In the square linear system $Ax = b$, if A is singular and b is not a linear combination of the columns of A then the system

Select one:

- a. can not tell
- b. has a unique solution
- c. has infinitely many solutions ✖
- d. has no solution

The correct answer is: has no solution

Question **9**

Correct

Mark 1.00 out of 1.00

If E is an elementary matrix of type III, then E^T is

Select one:

- a. not an elementary matrix
- b. an elementary matrix of type III ✔
- c. an elementary matrix of type I
- d. an elementary matrix of type II

The correct answer is: an elementary matrix of type III

Question **10**

Correct

Mark 1.00 out of 1.00

If $AB = 0$, where A and B are $n \times n$ nonzero matrices. Then

Select one:

- a. both A, B are nonsingular.
- b. both A, B are singular. ✔
- c. either A or B is singular
- d. either $A = 0$ or $B = 0$

The correct answer is: both A, B are singular.

Question **11**

Correct

Mark 1.00 out of 1.00

If A, B are $n \times n$-skew-symmetric matrices(A is skew symmetric if $A^T = -A$), then $AB + BA$ is symmetric

Select one:

- a. False
- b. True ✔

The correct answer is: True

Question **12**

Correct

Mark 1.00 out of 1.00

If A is a 3×3 matrix such that $det(A) = 2$, then $\det(3A) = 6$

Select one:

- a. True
- b. False ✔

The correct answer is: False

Question **13**

Correct

Mark 1.00 out of 1.00

The adjoint of the matrix $\begin{pmatrix} 2 & 5 \\ 1 & 3 \end{pmatrix}$ is

Select one:

a. $\begin{pmatrix} -5 & 3 \\ 2 & -1 \end{pmatrix}$

b. $\begin{pmatrix} -3 & 5 \\ 1 & -2 \end{pmatrix}$

c. $\begin{pmatrix} 3 & -5 \\ -1 & 2 \end{pmatrix}$ ✔

d. $\begin{pmatrix} -2 & 1 \\ 5 & -3 \end{pmatrix}$

The correct answer is: $\begin{pmatrix} 3 & -5 \\ -1 & 2 \end{pmatrix}$

Question **14**

Correct

Mark 1.00 out of 1.00

Let $(1,2,0)^T$ and $(2,1,1)^T$ be the first two columns of a 3×3 matrix A and $(1,1,1)^T$ be a solution of the system $Ax = (2,1,3)^T$. Then the third column of the matrix A is

Select one:

a. $(1,1,0)^T$.

b. $(-1,-2,2)^T$. ✔

c. $(4,-1,1)^T$.

d. $(-1,-1,2)^T$.

The correct answer is: $(-1,-2,2)^T$.

Question **15**

Correct

Mark 1.00 out of 1.00

$(0,0,0)^T$ is a linear combination of the vectors $(1,2,3)^T, (1,4,1)^T, (2,3,1)^T$

Select one:

a. True ✔

b. False

The correct answer is: True

Question **16**

Correct

Mark 1.00 out of 1.00

Let A be a 4×4-matrix such that $A \begin{bmatrix} 1 \\ 2 \\ 3 \\ 4 \end{bmatrix} = \begin{bmatrix} 0 \\ 0 \\ 0 \\ 0 \end{bmatrix}$, then

Select one:

a. There are elementary matrices $E_1, E_2, \cdots, E_k$ such that $A = E_1 E_2 \cdots E_k$

b. A is singular. ✔

c. A is the zero matrix

d. The system $Ax = 0$ has only one solution

The correct answer is: A is singular.

Question **17**

Incorrect

Mark 0.00 out of 1.00

Let A be a 3×4 matrix which has a row of zeros, and let B be a 4×4 matrix , then AB has a row of zeros.

Select one:

- a. False ✖
- b. True

The correct answer is: True

Question **18**

Incorrect

Mark 0.00 out of 1.00

If A is a 4×3 matrix such that $Ax = 0$ has only the zero solution, and $b = \begin{pmatrix} 1 \\ 3 \\ 2 \\ 0 \end{pmatrix}$, then the system $Ax = b$

Select one:

- a. is either inconsistent or has an infinite number of solutions
- b. is inconsistent
- c. is either inconsistent or has one solution
- d. has exactly one solution ✖

The correct answer is: is either inconsistent or has one solution

Question **19**

Correct

Mark 1.00 out of 1.00

If x_0 is a solution of the nonhomogeneous system $Ax = b$ and x_1 is a solution of the homogeneous system $Ax = 0$. Then $x_1 + x_0$ is a solution of

Select one:

- a. the system $Ax = 0$
- b. the system $Ax = 2b$
- c. the system $Ax = Ab$
- d. the system $Ax = b$ ✔

The correct answer is: the system $Ax = b$

Question **20**

Correct

Mark 1.00 out of 1.00

If A, B are two square nonzero matrices and $AB = 0$ then both A and B are singular

Select one:

- a. False
- b. True ✔

The correct answer is: True

Question **21**

Incorrect

Mark 0.00 out of 1.00

If A is a 3×3 matrix with $\det(A) = -1$. Then $\det(adj(A)) =$

Select one:

a. -1.

b. 3.

c. -3.

d. 1.

The correct answer is: 1.

Question **22**

Correct

Mark 1.00 out of 1.00

If A is a 3×5 matrix, then the system $Ax = 0$

Select one:

a. has no solution.

b. has only the zero solution

c. has infinitely many solutions

d. is inconsistent

The correct answer is: has infinitely many solutions

Question **23**

Correct

Mark 1.00 out of 1.00

If A is a nonsingular $n \times n$ matrix, $b \in \mathbb{R}^n$, then

Select one:

a. The system $Ax = b$ is inconsistent

b. The system $Ax = b$ has infinitely many solutions

c. The system $Ax = b$ has only two solutions

d. The system $Ax = b$ has a unique solution

The correct answer is: The system $Ax = b$ has a unique solution

Question **24**

Correct

Mark 1.00 out of 1.00

If A, B are $n \times n$ symmetric matrices then AB is symmetric.

Select one:

a. False

b. True

The correct answer is: False

Question **25**

Correct

Mark 1.00 out of 1.00

If A is a 2×3-matrix, and $b = a_2$ (second column of A), then a solution to the system $Ax = b$ is

Select one:

a. $x = \begin{pmatrix} 1 \\ 0 \\ 0 \\ 0 \end{pmatrix}$

b. $x = \begin{pmatrix} 1 \\ 0 \\ 0 \end{pmatrix}$

c. $x = \begin{pmatrix} 0 \\ 1 \\ 0 \end{pmatrix}$ ✔

d. $x = \begin{pmatrix} 0 \\ 1 \\ 0 \\ 0 \end{pmatrix}$

The correct answer is: $x = \begin{pmatrix} 0 \\ 1 \\ 0 \end{pmatrix}$

Question **26**

Incorrect

Mark 0.00 out of 1.00

If A and B are $n \times n$ matrices such that $Ax \neq Bx$ for all nonzero $x \in \mathbb{R}^n$. Then

Select one:

a. $A - B$ is nonsingular.

b. A and B are nonsingular. ✖

c. $A - B$ is singular.

d. A and B are singular.

The correct answer is: $A - B$ is nonsingular.

Question **27**

Correct

Mark 1.00 out of 1.00

If A is a nonsingular $n \times n$ matrix, then

Select one:

a. There are elementary matrices $E_1, E_2, \cdots, E_k$ such that $A = E_1 E_2 \cdots E_k$. ✔

b. There is a singular matrix C such that $A = CI$.

c. The system $Ax = 0$ has a nontrivial (nonzero) solution.

d. $\det(A) = 1$

The correct answer is: There are elementary matrices $E_1, E_2, \cdots, E_k$ such that $A = E_1 E_2 \cdots E_k$.

Question 28

Correct

Mark 1.00 out of 1.00

Any elementary matrix is nonsingular

Select one:

a. False

b. True

The correct answer is: True

Question 29

Correct

Mark 1.00 out of 1.00

If A is singular and B is nonsingular $n \times n$-matrices, then AB is

Select one:

a. singular

b. may or may not be singular

c. nonsingular

The correct answer is: singular

Question 30

Correct

Mark 1.00 out of 1.00

In the $n \times n$-linear system $Ax = b$, if A is singular and b is a linear combination of the columns of A then the system has

Select one:

a. exactly two solutions

b. no solution

c. a unique solution

d. infinitely many solutions

The correct answer is: infinitely many solutions

← Announcements

Jump to...

Started on	Tuesday, 24 November 2020, 4:00 PM
State	Finished
Completed on	Tuesday, 24 November 2020, 5:07 PM
Time taken	1 hour 7 mins
Grade	**24.00** out of 30.00 (**80**%)

Question **1**
Correct
Mark 1.00 out of 1.00

If A, B, C are 3×3-matrices, $\det(A) = 9, \det(B) = 2, \det(C) = 3$, then $\det(3C^T BA^{-1}) =$

Select one:
- a. 6
- b. 16
- c. 18 ✔
- d. 2

The correct answer is: 18

Question **2**
Correct
Mark 1.00 out of 1.00

Let $A = \begin{pmatrix} 1 & -1 & 1 \\ 3 & -2 & 2 \\ -2 & -2 & 3 \end{pmatrix}$, then $\det(A) =$

Select one:
- a. 1 ✔
- b. 9
- c. 7
- d. 0

The correct answer is: 1

Question **3**
Correct
Mark 1.00 out of 1.00

The adjoint of the matrix $\begin{pmatrix} 4 & 1 \\ 2 & -1 \end{pmatrix}$ is

Select one:
- a. $\begin{pmatrix} -1 & -1 \\ -2 & 4 \end{pmatrix}$ ✔
- b. $\begin{pmatrix} -1 & -2 \\ -3 & -5 \end{pmatrix}$
- c. $\begin{pmatrix} 4 & -1 \\ -2 & -1 \end{pmatrix}$
- d. $\begin{pmatrix} -1 & 2 \\ 1 & -4 \end{pmatrix}$

The correct answer is: $\begin{pmatrix} -1 & -1 \\ -2 & 4 \end{pmatrix}$

Question **4**

Correct

Mark 1.00 out of 1.00

If $A = \begin{pmatrix} 1 & 4 & -1 \\ 2 & 9 & 2 \\ -3 & -12 & 3 \end{pmatrix}$ then the lower triangular matrix L in the LU-facrorization of A is given by

Select one:

a. $L = \begin{pmatrix} 1 & 0 & 0 \\ 2 & 1 & 0 \\ -3 & 0 & 1 \end{pmatrix}$ ✔

b. $L = \begin{pmatrix} 1 & 0 & 0 \\ 2 & 1 & 0 \\ -3 & 0 & 0 \end{pmatrix}$

c. $L = \begin{pmatrix} 1 & 0 & 0 \\ -2 & 1 & 0 \\ 3 & 0 & 1 \end{pmatrix}$

d. $L = \begin{pmatrix} 1 & 0 & 0 \\ -2 & 1 & 0 \\ 3 & 0 & 0 \end{pmatrix}$

The correct answer is: $L = \begin{pmatrix} 1 & 0 & 0 \\ 2 & 1 & 0 \\ -3 & 0 & 1 \end{pmatrix}$

Question **5**

Correct

Mark 1.00 out of 1.00

Any two $n \times n$-singular matrices are row equivalent.

Select one:

a. True

b. False ✔

The correct answer is: False

Question **6**

Correct

Mark 1.00 out of 1.00

If A is a nonsingular and symmetric matrix, then

Select one:

a. A^{-1} is singular and symmetric

b. A^{-1} is singular and not symmetric

c. A^{-1} is nonsingular and symmetric ✔

d. A^{-1} is nonsingular and not symmetric

The correct answer is: A^{-1} is nonsingular and symmetric

Question 7

Correct

Mark 1.00 out of 1.00

If $AB = AC$, and $|A| \neq 0$, then

Select one:

a. $B \neq C$

b. $A = 0$

c. $A = C$

d. $B = C$. ✔

The correct answer is: $B = C$.

Question 8

Incorrect

Mark 0.00 out of 1.00

If A, B are $n \times n$ symmetric matrices then AB is symmetric.

Select one:

a. False

b. True ✖

The correct answer is: False

Question 9

Correct

Mark 1.00 out of 1.00

If y, z are solutions to $Ax = b$, then $y + z$ is a solution of the system $Ax = 0$.

Select one:

a. False ✔

b. True

The correct answer is: False

Question 10

Correct

Mark 1.00 out of 1.00

Let $A = \begin{pmatrix} 1 & 1 & 0 \\ 1 & a & 1 \\ 1 & 1 & 2 \end{pmatrix}$. the value(s) of a that make A nonsingular

Select one:

a. $a \neq \frac{1}{2}$

b. $a = 1$

c. $a = \frac{1}{2}$

d. $a \neq 1$ ✔

The correct answer is: $a \neq 1$

Question 11

Incorrect

Mark 0.00 out of 1.00

If A, B are $n \times n$-skew-symmetric matrices(A is skew symmetric if $A^T = -A$), then $AB + BA$ is symmetric

Select one:

a. True

b. False ✖

The correct answer is: True

Question **12**

Correct

Mark 1.00 out of 1.00

If A is a singular matrix, then A^T is also singular.

Select one:

- a. True ✔
- b. False

The correct answer is: True

Question **13**

Correct

Mark 1.00 out of 1.00

If A is a 4×3-matrix, $b \in \mathbb{R}^4$, and the system $Ax = b$ is consistent, then $Ax = b$ has a unique solution.

Select one:

- a. True
- b. False ✔

The correct answer is: False

Question **14**

Correct

Mark 1.00 out of 1.00

If A is a 4×4-matrix and $x = \begin{pmatrix} 2 \\ 3 \\ 0 \\ 1 \end{pmatrix}$ is a solution to the system $Ax = 0$, then A is singular.

Select one:

- a. False
- b. True ✔

The correct answer is: True

Question **15**

Correct

Mark 1.00 out of 1.00

If A and B are $n \times n$ matrices such that $Ax \neq Bx$ for all nonzero $x \in \mathbb{R}^n$. Then

Select one:

- a. $A - B$ is singular.
- b. A and B are nonsingular.
- c. $A - B$ is nonsingular. ✔
- d. A and B are singular.

The correct answer is: $A - B$ is nonsingular.

Question 16

Correct

Mark 1.00 out of 1.00

If $A = \begin{pmatrix} 1 & -2 & 5 \\ 4 & -11 & 8 \\ -3 & 3 & -27 \end{pmatrix}$ and $b = \begin{pmatrix} b_1 \\ b_2 \\ b_3 \end{pmatrix}$, then the system $Ax = b$ is consistent if and only if

Select one:

a. $7b_1 - b_2 + b_3 \neq 1$

b. $7b_1 - b_2 + b_3 \neq 0$

c. $7b_1 - b_2 + b_3 = 1$

d. $7b_1 - b_2 + b_3 = 0$ ✔

The correct answer is: $7b_1 - b_2 + b_3 = 0$

Question 17

Correct

Mark 1.00 out of 1.00

Any two $n \times n$-nonsingular matrices are row equivalent.

Select one:

a. False

b. True ✔

The correct answer is: True

Question 18

Correct

Mark 1.00 out of 1.00

A square matrix A is nonsingular iff its RREF (reduced row echelon form) is the identity matrix.

Select one:

a. True ✔

b. False

The correct answer is: True

Question **19**

Correct

Mark 1.00 out of 1.00

If the row echelon form of $(A|b)$ is $\begin{pmatrix} 1 & 0 & -2 & -1 & | & -2 \\ 0 & 1 & 1 & -1 & | & -1 \\ 0 & 0 & 1 & 1 & | & 0 \end{pmatrix}$ then the general form of the solutions is given by

Select one:

a. $x = \begin{pmatrix} -2-\alpha \\ 1-\alpha \\ \alpha \\ \alpha \end{pmatrix}$

b. $x = \begin{pmatrix} -2-\alpha \\ -1+2\alpha \\ -\alpha \\ \alpha \end{pmatrix}$ ✔

c. $x = \begin{pmatrix} \alpha \\ 2-\alpha \\ \alpha \\ \alpha \end{pmatrix}$

d. $x = \begin{pmatrix} -2-\alpha \\ 1-\alpha \\ \alpha \\ 1 \end{pmatrix}$

The correct answer is: $x = \begin{pmatrix} -2-\alpha \\ -1+2\alpha \\ -\alpha \\ \alpha \end{pmatrix}$

Question **20**

Incorrect

Mark 0.00 out of 1.00

If A is a 3×3 matrix with $\det(A) = -1$. Then $\det(adj(A)) =$

Select one:

a. 3. ✘

b. 1.

c. -1.

d. -3.

The correct answer is: 1.

Question **21**

Correct

Mark 1.00 out of 1.00

If A is a 3×3 matrix such that $det(A) = 2$, then $\det(3A) = 6$

Select one:

a. True

b. False ✔

The correct answer is: False

Question **22**

Correct

Mark 1.00 out of 1.00

If A is a 3×5 matrix, then the system $Ax = 0$

Select one:

- a. is inconsistent
- b. has infinitely many solutions ✔
- c. has no solution.
- d. has only the zero solution

The correct answer is: has infinitely many solutions

Question **23**

Correct

Mark 1.00 out of 1.00

Let U be an $n \times n$-matrix in reduced row echelon form and $U \neq I$, then

Select one:

- a. $\det(U) = 1$
- b. The system $Ux = 0$ has only the zero solution.
- c. U is the zero matrix
- d. The system $Ux = 0$ has infinitely many solutions ✔

The correct answer is: The system $Ux = 0$ has infinitely many solutions

Question **24**

Incorrect

Mark 0.00 out of 1.00

Let A be a 3×3-matrix with $a_1 = a_2$. If $b = a_2 - a_3$, where a_1, a_2, a_3 ar the columns of A, then a solution to the system $Ax = b$ is

Select one:

- a. $x = \begin{pmatrix} 1 \\ 0 \\ -1 \end{pmatrix}$
- b. $x = \begin{pmatrix} 1 \\ 1 \\ -1 \end{pmatrix}$ ✖
- c. $x = \begin{pmatrix} 1 \\ 1 \\ 0 \end{pmatrix}$
- d. $x = \begin{pmatrix} 0 \\ 0 \\ 2 \end{pmatrix}$

The correct answer is: $x = \begin{pmatrix} 1 \\ 0 \\ -1 \end{pmatrix}$

Question **25**

Correct

Mark 1.00 out of 1.00

If A is an $n \times n$ matrix and the system $Ax = b$ has infinitely many solutions, then

Select one:

a. A is nonsingular

b. A has a row of zeros

c. A is symmetric

d. A singular ✔

The correct answer is: A singular

Question **26**

Correct

Mark 1.00 out of 1.00

Let A be a 4×4-matrix such that $A \begin{bmatrix} 1 \\ 2 \\ 3 \\ 4 \end{bmatrix} = \begin{bmatrix} 0 \\ 0 \\ 0 \\ 0 \end{bmatrix}$, then

Select one:

a. A is the zero matrix

b. A is singular. ✔

c. The system $Ax = 0$ has only one solution

d. There are elementary matrices $E_1, E_2, \cdots, E_k$ such that $A = E_1 E_2 \cdots E_k$

The correct answer is: A is singular.

Question **27**

Incorrect

Mark 0.00 out of 1.00

If B is a 3×3 nonsingular matrix such that $B^3 = B$, then one of the following is always true

Select one:

a. $B^4 = B$.

b. $\det(B) = 1$. ✖

c. $B = 0$.

d. $B = B^{-1}$.

The correct answer is: $B = B^{-1}$.

Question **28**

Incorrect

Mark 0.00 out of 1.00

If A is a singular $n \times n$-matrix, $b \in \mathbb{R}^n$, then the system $Ax = b$

Select one:

a. is inconsistent

b. has a unique solution ✖

c. has infinitely many solutions.

d. has either no solution or an infinite number of solutions

The correct answer is: has either no solution or an infinite number of solutions

Question **29**

Correct

Mark 1.00 out of 1.00

Let $A = \begin{pmatrix} 1 & 2 & 3 & 0 \\ 1 & 1 & 2 & 1 \\ 2 & 3 & 5 & 1 \end{pmatrix}$ and $b = \begin{pmatrix} 2 \\ 1 \\ 4 \end{pmatrix}$. The system $Ax = b$

Select one:

- a. has exactly three solutions.
- b. has a unique solution
- c. is inconsistent ✔
- d. has infinitely many solutions

The correct answer is: is inconsistent

Question **30**

Correct

Mark 1.00 out of 1.00

Let $(1, 2, 0)^T$ and $(2, 1, 1)^T$ be the first two columns of a 3×3 matrix A and $(1, 1, 1)^T$ be a solution of the system $Ax = (2, 1, -1)^T$. Then the third column of the matrix A is

Select one:

- a. $(1, 2, 2)^T$.
- b. $(-1, -2, -2)^T$. ✔
- c. $(4, -1, 1)^T$.
- d. $(1, 1, 0)^T$.

The correct answer is: $(-1, -2, -2)^T$.

Started on	Monday, 19 October 2020, 10:01 AM
State	Finished
Completed on	Monday, 19 October 2020, 10:31 AM
Time taken	30 mins 1 sec
Marks	23.00/25.00
Grade	**9.20** out of 10.00 (**92**%)

Question **1**
Correct
Mark 2.00 out of 2.00

If a matrix A is row equivalent to I, then A is nonsingular.

Select one:
- a. True ✔
- b. False

Question **2**
Correct
Mark 2.00 out of 2.00

If a matrix A is nonsingular, then the matrix A^T is also nonsingular.

Select one:
- a. True ✔
- b. False

Question **3**
Correct
Mark 2.00 out of 2.00

If A and B are $n \times n$ nonsingular matrices, then AB is also nonsingular.

Select one:
- a. True ✔
- b. False

Question **4**
Correct
Mark 2.00 out of 2.00

If $Ax = b$ is an overdetermined and consistent linear system, then it must have infinitely many solutions.

Select one:
- a. True
- b. False ✔

Question **5**
Correct
Mark 2.00 out of 2.00

Let A be a 3×3 matrix and suppose that $A \begin{bmatrix} 1 \\ 0 \\ 0 \end{bmatrix} = \begin{bmatrix} 0 \\ 0 \\ 0 \end{bmatrix}$. Then

Select one:
- a. $Ax = 0 <$ has infinitely many solutions ✔
- b. $Ax = (1, 0, 0)^T$ has infinitely many solutions
- c. A is nonsingular
- d. None of the above

Question **6**
Correct
Mark 2.00 out of 2.00

If a matrix is in row echelon form, then it is also in reduced row echelon form.

Select one:
- a. True
- b. False ✔

b. False

Question **7**

Correct

Mark 3.00 out of 3.00

If $(A|b) = \left[\begin{array}{ccc|c} 1 & 0 & 2 & 1 \\ -1 & 1 & -1 & 0 \\ -1 & 0 & \alpha & \beta \end{array}\right]$ is the augmented matrix of the system $Ax = b$. Answer the following questions.

The system has no solution if

- $\alpha = -2$ and $\beta \neq -1$
- $\alpha = -2$ and $\beta = -1$
- $\alpha \neq -2$ and $\beta \neq -1$
- $\alpha \neq -2$ and $\beta = -1$

The system has exactly one solution if

- $\alpha = -2$ and $\beta = -1$
- $\alpha \neq -2$
- $\alpha = -2$
- $\alpha \neq -2$ and $\beta \neq -1$

The system has infinitely many solutions if

- $\alpha \neq -2$ and $\beta \neq -1$
- $\alpha = -2$ and $\beta \neq -1$
- $\alpha = -2$ and $\beta = -1$
- $\alpha \neq -2$ and $\beta = -1$

Question **8**

Correct

Mark 2.00 out of 2.00

Let $A = \begin{bmatrix} 1 & 2 & 1 \\ -1 & 1 & 0 \\ 1 & 8 & 1 \end{bmatrix}$. If we want to find the LU factorization of A, then $L =$

Select one:

a. $\begin{bmatrix} 1 & 0 & 0 \\ -1 & 1 & 0 \\ 1 & 2 & 1 \end{bmatrix}$

b. $\begin{bmatrix} 1 & 0 & 0 \\ -1 & 1 & 0 \\ 1 & 8 & 1 \end{bmatrix}$

c. $\begin{bmatrix} 1 & 0 & 0 \\ 1 & 1 & 0 \\ -1 & -2 & 1 \end{bmatrix}$

d. $\begin{bmatrix} 1 & 0 & 0 \\ 1 & 1 & 0 \\ -1 & -8 & 1 \end{bmatrix}$

Question **9**

Incorrect

Mark 0.00 out of 2.00

A homogeneous system can have a nontrivial solution.

Select one:

a. True

b. False

Question **10**

Correct

Mark 2.00 out of 2.00

The inverse of an elementary matrix is also an elementary matrix.

Select one:

a. True

b. False

Question **11**
Correct
Mark 2.00 out of 2.00

If a system of linear equations is undetermined, then it must have infinitely many solutions.

Select one:
- a. True
- b. False ✔

Question **12**
Correct
Mark 2.00 out of 2.00

The sum of two $n \times n$ nonsingular matrices is also nonsingular.

Select one:
- a. True
- b. False ✔

Started on	Monday, 19 October 2020, 5:39 PM
State	Finished
Completed on	Monday, 19 October 2020, 5:57 PM
Time taken	18 mins 13 secs
Grade	**10** out of 10 (**100**%)

Question **1**
Correct
Mark 1 out of 1

If $AB = 0$, where A and B are $n \times n$ matrices. Then

Select one:

a. either A or B is singular ✔

b. either $A = 0$ or $B = 0$

c. both A, B are singular.

d. both A, B are nonsingular.

The correct answer is: either A or B is singular

Question **2**
Correct
Mark 1 out of 1

If A, B, C are $n \times n$-matrices with $AB = AC$, then $B = C$

Select one:

a. False ✔

b. True

The correct answer is: False

Question **3**
Correct
Mark 1 out of 1

The sum of two elementary matrices is elementary

Select one:

a. False ✔

b. True

The correct answer is: False

Question **4**
Correct
Mark 1 out of 1

If A, B are $n \times n$-symmetric matrices, then $AB - BA$ is skew symmetric

Select one:

a. False

b. True ✔

The correct answer is: True

Question **5**

Correct

Mark 1 out of 1

In the square linear system $Ax = b$, if A is singular and b is a linear combination of the columns of A then the system has

Select one:

- a. no solution
- b. infinitely many solutions ✔
- c. a unique solution
- d. can not tell

The correct answer is: infinitely many solutions

Question **6**

Correct

Mark 1 out of 1

If A is a 3×3-matrix and the system $Ax = \begin{pmatrix} 5 \\ 1 \\ 3 \end{pmatrix}$ has a unique solution, then the system $Ax = \begin{pmatrix} 0 \\ 0 \\ 0 \end{pmatrix}$

Select one:

- a. has infinitely many solutions
- b. none of the above
- c. is inconsistent
- d. has only the zero solution. ✔

The correct answer is: has only the zero solution.

Question **7**

Correct

Mark 1 out of 1

If $(A|b) = \begin{pmatrix} 1 & 2 & 1 & -1 & | & 0 \\ 2 & 3 & 1 & 1 & | & -1 \\ 0 & 1 & 1 & \alpha & | & \beta \end{pmatrix}$, then the system is inconsistent if

Select one:

- a. $\alpha = -3$ and $\beta = 1$
- b. $\alpha \neq -3$ and $\beta \neq 1$
- c. $\alpha = -3$ and $\beta \neq 1$ ✔
- d. $\alpha \neq -3$ and β any number

The correct answer is: $\alpha = -3$ and $\beta \neq 1$

Question **8**

Correct

Mark 1 out of 1

If y, z are solutions to $Ax = b$, then $y - z$ is a solution of the system $Ax = 0$.

Select one:

- a. True ✔
- b. False

The correct answer is: True

Question 9
Correct
Mark 1 out of 1

If A is a 3×4-matrix, and $b = a_2$ (second column of A), then a solution to the system $Ax = b$ is

Select one:

a. $x = \begin{pmatrix} 0 \\ 1 \\ 0 \\ 0 \end{pmatrix}$

b. $x = \begin{pmatrix} 1 \\ 0 \\ 0 \end{pmatrix}$

c. $x = \begin{pmatrix} 1 \\ 0 \\ 0 \\ 0 \end{pmatrix}$

d. $x = \begin{pmatrix} 0 \\ 1 \\ 0 \end{pmatrix}$

The correct answer is: $x = \begin{pmatrix} 0 \\ 1 \\ 0 \\ 0 \end{pmatrix}$

Question 10
Correct
Mark 1 out of 1

If B is a 3×3 matrix such that $B^2 = B$. One of the following is always true

Select one:

a. $B^5 = B$.

b. $B = 0$.

c. $B = I$.

d. B is nonsingular.

The correct answer is: $B^5 = B$.

Started on	Tuesday, 24 November 2020, 3:50 PM
State	Finished
Completed on	Tuesday, 24 November 2020, 4:53 PM
Time taken	1 hour 2 mins
Grade	**28.00** out of 30.00 (**93**%)

Question **1**
Correct
Mark 1.00 out of 1.00

An $n \times n$ matrix A is invertible if and only if

Select one:
- a. $|A| = 0$
- b. $Ax = 0$ has a nonzero solution
- c. $A = I$
- d. there exists a matrix B such that $AB = I$ ✔

The correct answer is: there exists a matrix B such that $AB = I$

Question **2**
Correct
Mark 1.00 out of 1.00

$(0, 0, 0)^T$ is a linear combination of the vectors $(1, 2, 3)^T, (1, 4, 1)^T, (2, 3, 1)^T$

Select one:
- a. True ✔
- b. False

The correct answer is: True

Question **3**
Correct
Mark 1.00 out of 1.00

In the $n \times n$-linear system $Ax = b$, if A is singular and b is a linear combination of the columns of A then the system has

Select one:
- a. exactly two solutions
- b. no solution
- c. a unique solution
- d. infinitely many solutions ✔

The correct answer is: infinitely many solutions

Question **4**
Correct
Mark 1.00 out of 1.00

If y, z are solutions to $Ax = b$, then $y + z$ is a solution of the system $Ax = 0$.

Select one:
- a. True
- b. False ✔

The correct answer is: False

Question 5

Incorrect

Mark 0.00 out of 1.00

Any two $n \times n$-singular matrices are row equivalent.

Select one:

a. False

b. True ✖

The correct answer is: False

Question 6

Correct

Mark 1.00 out of 1.00

If A is a 4×3-matrix, $b \in \mathbb{R}^4$, and the system $Ax = b$ is consistent, then $Ax = b$ has a unique solution.

Select one:

a. True

b. False ✔

The correct answer is: False

Question 7

Correct

Mark 1.00 out of 1.00

If $(A|b) = \begin{pmatrix} 1 & 2 & -1 & | & 0 \\ 2 & 3 & 1 & | & -1 \\ 1 & 1 & \alpha & | & \beta \end{pmatrix}$, then the system has only one solution if

Select one:

a. $\alpha \neq 2$ and β any number ✔

b. $\alpha \neq 2$ and $\beta \neq -1$

c. $\alpha = 2$ and $\beta = -1$

d. $\alpha = 2$ and $\beta \neq -1$

The correct answer is: $\alpha \neq 2$ and β any number

Question 8

Correct

Mark 1.00 out of 1.00

If A is a nonsingular 3×3-matrix, then the reduced row echelon form of A has no row of zeros.

Select one:

a. False

b. True ✔

The correct answer is: True

Question 9

Correct

Mark 1.00 out of 1.00

If E is an elementary matrix then one of the following statements is not true

Select one:

a. E^{-1} is an elementary matrix.

b. E is nonsingular.

c. E^T is an elementary matrix.

d. $E + E^T$ is an elementary matrix. ✔

The correct answer is: $E + E^T$ is an elementary matrix.

Question 10

Correct

Mark 1.00 out of 1.00

If A is a 3×3 matrix with $\det(A) = -2$. Then $\det(adj(A)) =$

Select one:

- a. 4. ✔
- b. -4.
- c. -8.
- d. 8.

The correct answer is: 4.

Question 11

Correct

Mark 1.00 out of 1.00

If A is singular and B is nonsingular $n \times n$-matrices, then AB is

Select one:

- a. singular ✔
- b. may or may not be singular
- c. nonsingular

The correct answer is: singular

Question 12

Correct

Mark 1.00 out of 1.00

If $(A|b) = \begin{pmatrix} 1 & 1 & 2 & | & 4 \\ 2 & -1 & 2 & | & 6 \\ 1 & 1 & 2 & | & 5 \end{pmatrix}$, then the system $Ax = b$ is inconsistent

Select one:

- a. True ✔
- b. False

The correct answer is: True

Question 13

Correct

Mark 1.00 out of 1.00

If A is a singular $n \times n$-matrix, $b \in \mathbb{R}^n$, then the system $Ax = b$

Select one:

- a. has either no solution or an infinite number of solutions ✔
- b. has infinitely many solutions.
- c. has a unique solution
- d. is inconsistent

The correct answer is: has either no solution or an infinite number of solutions

Question 14

Correct

Mark 1.00 out of 1.00

If A is symmetric and skew symmetric then $A = 0$. (A is skew symmetric if $A = -A^T$).

Select one:

- a. True ✔
- b. False

The correct answer is: True

Question **15**
Correct
Mark 1.00 out of 1.00

If $A = LU$ is the LU-factorization of a matrix A, and A is singular, then

Select one:
- a. L and U are both singular
- b. U is singular and L is nonsigular ✔
- c. L and U are both nonsingular
- d. L is singular and U is nonsigular

The correct answer is: U is singular and L is nonsigular

Question **16**
Correct
Mark 1.00 out of 1.00

If A and B are singular matrices, then $A + B$ is also singular.

Select one:
- a. False ✔
- b. True

The correct answer is: False

Question **17**
Correct
Mark 1.00 out of 1.00

If A is a singular matrix, then A can be written as a product of elementary matrices.

Select one:
- a. False ✔
- b. True

The correct answer is: False

Question **18**
Correct
Mark 1.00 out of 1.00

Let $(1, 2, 0)^T$ and $(2, 1, 1)^T$ be the first two columns of a 3×3 matrix A and $(1, 1, 1)^T$ be a solution of the system $Ax = (4, 4, 5)^T$. Then the third column of the matrix A is

Select one:
- a. $(1, 1, 4)^T$. ✔
- b. $(4, -1, 1)^T$.
- c. $(-1, -1, -4)^T$.
- d. $(-1, -2, 1)^T$.

The correct answer is: $(1, 1, 4)^T$.

Question **19**
Correct
Mark 1.00 out of 1.00

Let A be a 3×4 matrix which has a row of zeros, and let B be a 4×4 matrix , then AB has a row of zeros.

Select one:
- a. True ✔
- b. False

The correct answer is: True

Question 20

Correct

Mark 1.00 out of 1.00

Let A be a 4×4-matrix such that $A \begin{bmatrix} 1 \\ 2 \\ 3 \\ 4 \end{bmatrix} = \begin{bmatrix} 0 \\ 0 \\ 0 \\ 0 \end{bmatrix}$, then

Select one:

a. There are elementary matrices $E_1, E_2, \cdots, E_k$ such that $A = E_1 E_2 \cdots E_k$

b. A is the zero matrix

c. The system $Ax = 0$ has only one solution

d. A is singular.

The correct answer is: A is singular.

Question 21

Correct

Mark 1.00 out of 1.00

If E is an elementary matrix of type III, then E^T is

Select one:

a. an elementary matrix of type I

b. an elementary matrix of type II

c. not an elementary matrix

d. an elementary matrix of type III

The correct answer is: an elementary matrix of type III

Question 22

Correct

Mark 1.00 out of 1.00

Let $A = \begin{pmatrix} 1 & -1 & 1 \\ 3 & -2 & 2 \\ -2 & -1 & 3 \end{pmatrix}$, then $\det(A) =$

Select one:

a. 2

b. 3

c. 5

d. 0

The correct answer is: 2

Question **23**

Correct

Mark 1.00 out of 1.00

If the row echelon form of $(A|b)$ is $\begin{pmatrix} 1 & 0 & -2 & -1 & | & -2 \\ 0 & 1 & 1 & -1 & | & -1 \\ 0 & 0 & 1 & 1 & | & 0 \end{pmatrix}$ then the general form of the solutions is given by

Select one:

- a. $x = \begin{pmatrix} -2-\alpha \\ 1-\alpha \\ \alpha \\ \alpha \end{pmatrix}$
- b. $x = \begin{pmatrix} -2-\alpha \\ 1-\alpha \\ \alpha \\ 1 \end{pmatrix}$
- c. $x = \begin{pmatrix} -2-\alpha \\ -1+2\alpha \\ -\alpha \\ \alpha \end{pmatrix}$ ✔
- d. $x = \begin{pmatrix} \alpha \\ 2-\alpha \\ \alpha \\ \alpha \end{pmatrix}$

The correct answer is: $x = \begin{pmatrix} -2-\alpha \\ -1+2\alpha \\ -\alpha \\ \alpha \end{pmatrix}$

Question **24**

Correct

Mark 1.00 out of 1.00

If A, B are $n \times n$-skew-symmetric matrices(A is skew symmetric if $A^T = -A$), then $AB + BA$ is symmetric

Select one:

- a. True ✔
- b. False

The correct answer is: True

Question **25**

Correct

Mark 1.00 out of 1.00

Let A be a 4×3-matrix with $a_2 - a_3 = 0$. If $b = a_1 + a_2 + a_3$, where a_j is the jth column of A, then the system $Ax = b$ will have infinitely many solutions.

Select one:

- a. False
- b. True ✔

The correct answer is: True

Question **26**
Correct
Mark 1.00 out of 1.00

If A is a 3×3-matrix and the system $Ax = \begin{pmatrix} 5 \\ 1 \\ 3 \end{pmatrix}$ has a unique solution, then the system $Ax = \begin{pmatrix} 0 \\ 0 \\ 0 \end{pmatrix}$

Select one:

- a. is inconsistent
- b. has only the zero solution. ✔
- c. has infinitely many solutions

The correct answer is: has only the zero solution.

Question **27**
Incorrect
Mark 0.00 out of 1.00

If $AB = 0$, where A and B are $n \times n$ nonzero matrices. Then

Select one:

- a. either A or B is singular
✖
- b. both A, B are singular.
- c. both A, B are nonsingular.
- d. either $A = 0$ or $B = 0$

The correct answer is: both A, B are singular.

Question **28**
Correct
Mark 1.00 out of 1.00

If x_0 is a solution of the nonhomogeneous system $Ax = b$ and x_1 is a solution of the homogeneous system $Ax = 0$. Then $x_1 + x_0$ is a solution of

Select one:

- a. the system $Ax = 0$
- b. the system $Ax = 2b$
- c. the system $Ax = Ab$
- d. the system $Ax = b$
✔

The correct answer is: the system $Ax = b$

Question **29**
Correct
Mark 1.00 out of 1.00

If A is a nonsingular $n \times n$ matrix, $b \in \mathbb{R}^n$, then

Select one:

- a. The system $Ax = b$ is inconsistent
- b. The system $Ax = b$ has only two solutions
- c. The system $Ax = b$ has a unique solution
✔
- d. The system $Ax = b$ has infinitely many solutions

The correct answer is: The system $Ax = b$ has a unique solution

Question **30**

Correct

Mark 1.00 out of 1.00

The adjoint of the matrix $\begin{pmatrix} -1 & 2 \\ 1 & 3 \end{pmatrix}$ is

Select one:

a. $\begin{pmatrix} -1 & 1 \\ 2 & -3 \end{pmatrix}$

b. $\begin{pmatrix} 1 & -2 \\ -1 & -3 \end{pmatrix}$

c. $\begin{pmatrix} 3 & -2 \\ -1 & -1 \end{pmatrix}$ ✔

d. $\begin{pmatrix} 1 & 1 \\ 2 & 3 \end{pmatrix}$

The correct answer is: $\begin{pmatrix} 3 & -2 \\ -1 & -1 \end{pmatrix}$

Started on	Tuesday, 24 November 2020, 3:51 PM
State	Finished
Completed on	Tuesday, 24 November 2020, 4:48 PM
Time taken	57 mins 9 secs
Grade	**28.00** out of 30.00 (**93**%)

Question **1**
Correct
Mark 1.00 out of 1.00

Let $A = \begin{pmatrix} 1 & -1 & 1 \\ 3 & -2 & 2 \\ -2 & 4 & 3 \end{pmatrix}$, then $\det(A) =$

Select one:

a. 0

b. 9

c. 5

d. 7 ✔

The correct answer is: 7

Question **2**
Correct
Mark 1.00 out of 1.00

If A is a 2×3-matrix, and $b = a_2$ (second column of A), then a solution to the system $Ax = b$ is

Select one:

a. $x = \begin{pmatrix} 1 \\ 0 \\ 0 \\ 0 \end{pmatrix}$

b. $x = \begin{pmatrix} 1 \\ 0 \\ 0 \end{pmatrix}$

c. $x = \begin{pmatrix} 0 \\ 1 \\ 0 \\ 0 \end{pmatrix}$

d. $x = \begin{pmatrix} 0 \\ 1 \\ 0 \end{pmatrix}$ ✔

The correct answer is: $x = \begin{pmatrix} 0 \\ 1 \\ 0 \end{pmatrix}$

Question 3

Correct

Mark 1.00 out of 1.00

If A is a 2×2 matrix with $\det(A) = -2$. Then $\det(adj(A)) =$

Select one:

a. 2.

b. -2. ✔

c. -4.

d. 4.

The correct answer is: -2.

Question 4

Correct

Mark 1.00 out of 1.00

If A, B, C are $n \times n$ nonsingular matrices, then $A^2 - B^2 = (A+B)(A-B)$.

Select one:

a. False ✔

b. True

The correct answer is: False

Question 5

Correct

Mark 1.00 out of 1.00

If A is a singular matrix, then A can be written as a product of elementary matrices.

Select one:

a. False ✔

b. True

The correct answer is: False

Question 6

Correct

Mark 1.00 out of 1.00

The adjoint of the matrix $\begin{pmatrix} 5 & 2 \\ -1 & 6 \end{pmatrix}$ is

Select one:

a. $\begin{pmatrix} 5 & -1 \\ 2 & 6 \end{pmatrix}$

b. $\begin{pmatrix} 6 & -2 \\ 1 & 5 \end{pmatrix}$ ✔

c. $\begin{pmatrix} -5 & -1 \\ 2 & -6 \end{pmatrix}$

d. $\begin{pmatrix} -6 & 2 \\ -1 & -5 \end{pmatrix}$

The correct answer is: $\begin{pmatrix} 6 & -2 \\ 1 & 5 \end{pmatrix}$

Question 7

Correct

Mark 1.00 out of 1.00

If A and B are $n \times n$ matrices such that $Ax \neq Bx$ for all nonzero $x \in \mathbb{R}^n$. Then

Select one:

a. A and B are singular.

b. $A - B$ is singular.

c. A and B are nonsingular.

d. $A - B$ is nonsingular. ✔

The correct answer is: $A - B$ is nonsingular.

Question 8

Incorrect

Mark 0.00 out of 1.00

If y, z are solutions to $Ax = b$, then $\frac{1}{3}y + \frac{3}{4}z$ is a solution of the system $Ax = b$.

Select one:

a. False

b. True ✖

The correct answer is: False

Question 9

Correct

Mark 1.00 out of 1.00

Let A be a 4×4-matrix such that $A \begin{bmatrix} 1 \\ 2 \\ 3 \\ 4 \end{bmatrix} = \begin{bmatrix} 0 \\ 0 \\ 0 \\ 0 \end{bmatrix}$, then

Select one:

a. There are elementary matrices $E_1, E_2, \cdots, E_k$ such that $A = E_1 E_2 \cdots E_k$

b. The system $Ax = 0$ has only one solution

c. A is singular. ✔

d. A is the zero matrix

The correct answer is: A is singular.

Question 10

Correct

Mark 1.00 out of 1.00

If A is symmetric and skew symmetric then $A = 0$. (A is skew symmetric if $A = -A^T$).

Select one:

a. False

b. True ✔

The correct answer is: True

Question 11
Correct
Mark 1.00 out of 1.00

An $n \times n$ matrix A is invertible if and only if

Select one:
- a. there exists a matrix B such that $AB = I$ ✔
- b. $A = I$
- c. $|A| = 0$
- d. $Ax = 0$ has a nonzero solution

The correct answer is: there exists a matrix B such that $AB = I$

Question 12
Correct
Mark 1.00 out of 1.00

If A, B, C are $n \times n$-matrices with A nonsigular and $AB = AC$, then $B = C$

Select one:
- a. False
- b. True ✔

The correct answer is: True

Question 13
Correct
Mark 1.00 out of 1.00

In the square linear system $Ax = b$, if A is singular and b is not a linear combination of the columns of A then the system

Select one:
- a. has a unique solution
- b. has infinitely many solutions
- c. can not tell
- d. has no solution ✔

The correct answer is: has no solution

Question 14
Correct
Mark 1.00 out of 1.00

Any two $n \times n$-singular matrices are row equivalent.

Select one:
- a. False ✔
- b. True

The correct answer is: False

Question 15
Correct
Mark 1.00 out of 1.00

If A is a singular $n \times n$-matrix, $b \in \mathbb{R}^n$, then the system $Ax = b$

Select one:
- a. is inconsistent
- b. has a unique solution
- c. has either no solution or an infinite number of solutions ✔
- d. has infinitely many solutions.

The correct answer is: has either no solution or an infinite number of solutions

Question **16**

Correct

Mark 1.00 out of 1.00

Let A be a 3×4 matrix which has a row of zeros, and let B be a 4×4 matrix , then AB has a row of zeros.

Select one:

- a. True ✔
- b. False

The correct answer is: True

Question **17**

Correct

Mark 1.00 out of 1.00

If E is an elementary matrix of type III, then E^T is

Select one:

- a. an elementary matrix of type II
- b. an elementary matrix of type I
- c. an elementary matrix of type III ✔
- d. not an elementary matrix

The correct answer is: an elementary matrix of type III

Question **18**

Correct

Mark 1.00 out of 1.00

If the row echelon form of $(A|b)$ is $\begin{pmatrix} 1 & 0 & -2 & -1 & | & -2 \\ 0 & 1 & 1 & -1 & | & -1 \\ 0 & 0 & 1 & 1 & | & 0 \end{pmatrix}$ then the general form of the solutions is given by

Select one:

- a. $x = \begin{pmatrix} -2-\alpha \\ 1-\alpha \\ \alpha \\ \alpha \end{pmatrix}$
- b. $x = \begin{pmatrix} -2-\alpha \\ 1-\alpha \\ \alpha \\ 1 \end{pmatrix}$
- c. $x = \begin{pmatrix} -2-\alpha \\ -1+2\alpha \\ -\alpha \\ \alpha \end{pmatrix}$ ✔
- d. $x = \begin{pmatrix} \alpha \\ 2-\alpha \\ \alpha \\ \alpha \end{pmatrix}$

The correct answer is: $x = \begin{pmatrix} -2-\alpha \\ -1+2\alpha \\ -\alpha \\ \alpha \end{pmatrix}$

Question 19

Incorrect

Mark 0.00 out of 1.00

If $(A|b) = \begin{pmatrix} 1 & 1 & 2 & | & 4 \\ 2 & -1 & 2 & | & 6 \\ 0 & 3 & 2 & | & 1 \end{pmatrix}$ is the augmented matrix of the system $Ax = b$ then the system has no solution

Select one:

- a. False ✖
- b. True

The correct answer is: True

Question 20

Correct

Mark 1.00 out of 1.00

If $(A|b) = \begin{pmatrix} 1 & 2 & -1 & | & 0 \\ 2 & 3 & 1 & | & -1 \\ 1 & 1 & \alpha & | & \beta \end{pmatrix}$, then the system is inconsistent if

Select one:

- a. $\alpha \neq 2$ and $\beta \neq -1$
- b. $\alpha \neq 2$ and β any number
- c. $\alpha = 2$ and $\beta = -1$
- d. $\alpha = 2$ and $\beta \neq -1$ ✔

The correct answer is: $\alpha = 2$ and $\beta \neq -1$

Question 21

Correct

Mark 1.00 out of 1.00

Let $(1, 2, 0)^T$ and $(2, 1, 1)^T$ be the first two columns of a 3×3 matrix A and $(1, 1, 1)^T$ be a solution of the system $Ax = (5, 2, 4)^T$. Then the third column of the matrix A is

Select one:

- a. $(-2, 1, -3)^T$.
- b. $(1, -1, -4)^T$.
- c. $(2, -1, 3)^T$. ✔
- d. $(1, -1, 4)^T$.

The correct answer is: $(2, -1, 3)^T$.

Question 22

Correct

Mark 1.00 out of 1.00

If A is a nonsingular $n \times n$ matrix, then

Select one:

- a. There are elementary matrices $E_1, E_2, \cdots, E_k$ such that $A = E_1 E_2 \cdots E_k$. ✔
- b. $\det(A) = 1$
- c. There is a singular matrix C such that $A = CI$.
- d. The system $Ax = 0$ has a nontrivial (nonzero) solution.

The correct answer is: There are elementary matrices $E_1, E_2, \cdots, E_k$ such that $A = E_1 E_2 \cdots E_k$.

Question 23
Correct
Mark 1.00 out of 1.00

If A is a symmetric $n \times n$-matrix and P any $n \times n$-matrix, then PAP^T is

Select one:
- a. symmetric ✔
- b. not defined
- c. singular
- d. not symmetric

The correct answer is: symmetric

Question 24
Correct
Mark 1.00 out of 1.00

If A is an $n \times n$ matrix and the system $Ax = b$ has infinitely many solutions, then

Select one:
- a. A is symmetric
- b. A has a row of zeros
- c. A singular ✔
- d. A is nonsingular

The correct answer is: A singular

Question 25
Correct
Mark 1.00 out of 1.00

If A is a 3×3 matrix such that $det(A) = 2$, then $\det(3A) = 6$

Select one:
- a. False ✔
- b. True

The correct answer is: False

Question 26
Correct
Mark 1.00 out of 1.00

If A, B, C are 3×3-matrices, $\det(A) = 9, \det(B) = 2, \det(C) = 3$, then $\det(3C^T BA^{-1}) =$

Select one:
- a. 6
- b. 18 ✔
- c. 16
- d. 2

The correct answer is: 18

Question 27
Correct
Mark 1.00 out of 1.00

If A and B are singular matrices, then $A + B$ is also singular.

Select one:
- a. False ✔
- b. True

The correct answer is: False

Question **28**

Correct

Mark 1.00 out of 1.00

In the $n \times n$-linear system $Ax = b$, if A is singular and b is a linear combination of the columns of A then the system has

Select one:

a. no solution

b. a unique solution

c. infinitely many solutions ✔

d. exactly two solutions

The correct answer is: infinitely many solutions

Question **29**

Correct

Mark 1.00 out of 1.00

If A is a 4×3-matrix, $b \in \mathbb{R}^4$, and the system $Ax = b$ is consistent, then $Ax = b$ has a unique solution.

Select one:

a. False ✔

b. True

The correct answer is: False

Da

Sv

Question **30**

Correct

Mark 1.00 out of 1.00

If A is a 3×3-matrix and the system $Ax = \begin{pmatrix} 5 \\ 1 \\ 3 \end{pmatrix}$ has a unique solution, then the system $Ax = \begin{pmatrix} 0 \\ 0 \\ 0 \end{pmatrix}$

Select one:

a. has infinitely many solutions

b. has only the zero solution. ✔

c. is inconsistent

The correct answer is: has only the zero solution.

Question **1**

Incorrect

Mark 0.00 out of 1.00

If A is a 4×3-matrix, $b \in \mathbb{R}^4$, and the system $Ax = b$ is consistent, then $Ax = b$ has a unique solution.

Select one:

- a. False
- b. True ✖

The correct answer is: False

Question **2**

Incorrect

Mark 0.00 out of 1.00

If A is a singular matrix, then the system $Ax = b$ has infinite number of solutions

Select one:

- a. True ✖
- b. False

The correct answer is: False

α

Question **4**

Correct

Mark 1.00 out of 1.00

If $(A|b) = \begin{pmatrix} 1 & 2 & -1 & | & 0 \\ 2 & 3 & 1 & | & -1 \\ 1 & 1 & \alpha & | & \beta \end{pmatrix}$, then the system has infinite number of solutions if

Select one:

- a. $\alpha \neq 2$ and β any number
- b. $\alpha = 2$ and $\beta \neq -1$
- c. $\alpha = 2$ and $\beta = -1$ ✔
- d. $\alpha \neq 2$ and $\beta \neq -1$

The correct answer is: $\alpha = 2$ and $\beta = -1$

Question **5**

Correct

Mark 1.00 out of 1.00

Let $A = \begin{pmatrix} 1 & -1 & 1 \\ 3 & -2 & 2 \\ -2 & 1 & 3 \end{pmatrix}$, then $\det(A) =$

Select one:

- a. 4 ✔
- b. 0
- c. 8
- d. 1

The correct answer is: 4

Question **6**

Correct

Mark 1.00 out of 1.00

If $(A|b) = \begin{pmatrix} 1 & 1 & 2 & | & 4 \\ 2 & -1 & 2 & | & 6 \\ 1 & 1 & 2 & | & 5 \end{pmatrix}$, then the system $Ax = b$ is inconsistent

Select one:

- a. False
- b. True ✔

The correct answer is: True

Question **7**

Incorrect

Mark 0.00 out of 1.00

If a matrix B is obtained from A by multiplying a row of A by a real number c, then $|A| = c|B|$.

Select one:

- a. False
- b. True ✖

The correct answer is: False

Question 8
Incorrect
Mark 0.00 out of 1.00

In the square linear system $Ax = b$, if A is singular and b is not a linear combination of the columns of A then the system

Select one:
- a. can not tell
- b. has a unique solution
- c. has infinitely many solutions ✖
- d. has no solution

The correct answer is: has no solution

Question 9
Correct
Mark 1.00 out of 1.00

If E is an elementary matrix of type III, then E^T is

Select one:
- a. not an elementary matrix
- b. an elementary matrix of type III ✔
- c. an elementary matrix of type I
- d. an elementary matrix of type II

The correct answer is: an elementary matrix of type III

Question 10
Correct
Mark 1.00 out of 1.00

If $AB = 0$, where A and B are $n \times n$ nonzero matrices. Then

Select one:
- a. both A, B are nonsingular.
- b. both A, B are singular. ✔
- c. either A or B is singular
- d. either $A = 0$ or $B = 0$

The correct answer is: both A, B are singular.

Question 11
Correct
Mark 1.00 out of 1.00

If A, B are $n \times n$-skew-symmetric matrices(A is skew symmetric if $A^T = -A$), then $AB + BA$ is symmetric

Select one:
- a. False
- b. True ✔

The correct answer is: True

Question 12
Correct
Mark 1.00 out of 1.00

If A is a 3×3 matrix such that $det(A) = 2$, then $\det(3A) = 6$

Select one:
- a. True
- b. False ✔

The correct answer is: False

Question **13**
Correct
Mark 1.00 out of 1.00

The adjoint of the matrix $\begin{pmatrix} 2 & 5 \\ 1 & 3 \end{pmatrix}$ is

Select one:

a. $\begin{pmatrix} -5 & 3 \\ 2 & -1 \end{pmatrix}$

b. $\begin{pmatrix} -3 & 5 \\ 1 & -2 \end{pmatrix}$

c. $\begin{pmatrix} 3 & -5 \\ -1 & 2 \end{pmatrix}$ ✔

d. $\begin{pmatrix} -2 & 1 \\ 5 & -3 \end{pmatrix}$

The correct answer is: $\begin{pmatrix} 3 & -5 \\ -1 & 2 \end{pmatrix}$

Question **14**
Correct
Mark 1.00 out of 1.00

Let $(1,2,0)^T$ and $(2,1,1)^T$ be the first two columns of a 3×3 matrix A and $(1,1,1)^T$ be a solution of the system $Ax = (2,1,3)^T$. Then the third column of the matrix A is

Select one:

a. $(1,1,0)^T$.

b. $(-1,-2,2)^T$. ✔

c. $(4,-1,1)^T$.

d. $(-1,-1,2)^T$.

The correct answer is: $(-1,-2,2)^T$.

Question **15**
Correct
Mark 1.00 out of 1.00

$(0,0,0)^T$ is a linear combination of the vectors $(1,2,3)^T, (1,4,1)^T, (2,3,1)^T$

Select one:

a. True ✔

b. False

The correct answer is: True

Question **16**
Correct
Mark 1.00 out of 1.00

Let A be a 4×4-matrix such that $A \begin{bmatrix} 1 \\ 2 \\ 3 \\ 4 \end{bmatrix} = \begin{bmatrix} 0 \\ 0 \\ 0 \\ 0 \end{bmatrix}$, then

Select one:

a. There are elementary matrices $E_1, E_2, \cdots, E_k$ such that $A = E_1 E_2 \cdots E_k$

b. A is singular. ✔

c. A is the zero matrix

d. The system $Ax = 0$ has only one solution

The correct answer is: A is singular.

Question 17

Incorrect

Mark 0.00 out of 1.00

Let A be a 3×4 matrix which has a row of zeros, and let B be a 4×4 matrix , then AB has a row of zeros.

Select one:

- a. False ✖
- b. True

The correct answer is: True

Question 18

Incorrect

Mark 0.00 out of 1.00

If A is a 4×3 matrix such that $Ax = 0$ has only the zero solution, and $b = \begin{pmatrix} 1 \\ 3 \\ 2 \\ 0 \end{pmatrix}$, then the system $Ax = b$

Select one:

- a. is either inconsistent or has an infinite number of solutions
- b. is inconsistent
- c. is either inconsistent or has one solution
- d. has exactly one solution ✖

The correct answer is: is either inconsistent or has one solution

Question 19

Correct

Mark 1.00 out of 1.00

If x_0 is a solution of the nonhomogeneous system $Ax = b$ and x_1 is a solution of the homogeneous system $Ax = 0$. Then $x_1 + x_0$ is a solution of

Select one:

- a. the system $Ax = 0$
- b. the system $Ax = 2b$
- c. the system $Ax = Ab$
- d. the system $Ax = b$ ✔

The correct answer is: the system $Ax = b$

Question 20

Correct

Mark 1.00 out of 1.00

If A, B are two square nonzero matrices and $AB = 0$ then both A and B are singular

Select one:

- a. False
- b. True ✔

The correct answer is: True

Question **21**

Incorrect

Mark 0.00 out of 1.00

If A is a 3×3 matrix with $\det(A) = -1$. Then $\det(adj(A)) =$

Select one:

- a. -1.
- b. 3.
- c. -3.
- d. 1.

The correct answer is: 1.

Question **22**

Correct

Mark 1.00 out of 1.00

If A is a 3×5 matrix, then the system $Ax = 0$

Select one:

- a. has no solution.
- b. has only the zero solution
- c. has infinitely many solutions
- d. is inconsistent

The correct answer is: has infinitely many solutions

Question **23**

Correct

Mark 1.00 out of 1.00

If A is a nonsingular $n \times n$ matrix, $b \in \mathbb{R}^n$, then

Select one:

- a. The system $Ax = b$ is inconsistent
- b. The system $Ax = b$ has infinitely many solutions
- c. The system $Ax = b$ has only two solutions
- d. The system $Ax = b$ has a unique solution

The correct answer is: The system $Ax = b$ has a unique solution

Question **24**

Correct

Mark 1.00 out of 1.00

If A, B are $n \times n$ symmetric matrices then AB is symmetric.

Select one:

- a. False
- b. True

The correct answer is: False

Question **25**

Correct

Mark 1.00 out of 1.00

If A is a 2×3-matrix, and $b = a_2$ (second column of A), then a solution to the system $Ax = b$ is

Select one:

a. $x = \begin{pmatrix} 1 \\ 0 \\ 0 \\ 0 \end{pmatrix}$

b. $x = \begin{pmatrix} 1 \\ 0 \\ 0 \end{pmatrix}$

c. $x = \begin{pmatrix} 0 \\ 1 \\ 0 \end{pmatrix}$ ✔

d. $x = \begin{pmatrix} 0 \\ 1 \\ 0 \\ 0 \end{pmatrix}$

The correct answer is: $x = \begin{pmatrix} 0 \\ 1 \\ 0 \end{pmatrix}$

Question **26**

Incorrect

Mark 0.00 out of 1.00

If A and B are $n \times n$ matrices such that $Ax \neq Bx$ for all nonzero $x \in \mathbb{R}^n$. Then

Select one:

a. $A - B$ is nonsingular.

b. A and B are nonsingular. ✖

c. $A - B$ is singular.

d. A and B are singular.

The correct answer is: $A - B$ is nonsingular.

Question **27**

Correct

Mark 1.00 out of 1.00

If A is a nonsingular $n \times n$ matrix, then

Select one:

a. There are elementary matrices $E_1, E_2, \cdots, E_k$ such that $A = E_1 E_2 \cdots E_k$. ✔

b. There is a singular matrix C such that $A = CI$.

c. The system $Ax = 0$ has a nontrivial (nonzero) solution.

d. det$(A) = 1$

The correct answer is: There are elementary matrices $E_1, E_2, \cdots, E_k$ such that $A = E_1 E_2 \cdots E_k$.

Question **28**

Correct

Mark 1.00 out of 1.00

Any elementary matrix is nonsigular

Select one:

- a. False
- b. True ✔

The correct answer is: True

Question **29**

Correct

Mark 1.00 out of 1.00

If A is singular and B is nonsingular $n \times n$-matrices, then AB is

Select one:

- a. singular ✔
- b. may or may not be singular
- c. nonsingular

The correct answer is: singular

Question **30**

Correct

Mark 1.00 out of 1.00

In the $n \times n$-linear system $Ax = b$, if A is singular and b is a linear combination of the columns of A then the system has

Select one:

- a. exactly two solutions
- b. no solution
- c. a unique solution
- d. infinitely many solutions ✔

The correct answer is: infinitely many solutions

← Announcements

Jump to...

Started on	Tuesday, 24 November 2020, 4:00 PM
State	Finished
Completed on	Tuesday, 24 November 2020, 5:07 PM
Time taken	1 hour 7 mins
Grade	**24.00** out of 30.00 (**80**%)

Question **1**
Correct
Mark 1.00 out of 1.00

If A, B, C are 3×3-matrices, $\det(A) = 9, \det(B) = 2, \det(C) = 3$, then $\det(3C^T BA^{-1}) =$

Select one:
- a. 6
- b. 16
- c. 18 ✔
- d. 2

The correct answer is: 18

Question **2**
Correct
Mark 1.00 out of 1.00

Let $A = \begin{pmatrix} 1 & -1 & 1 \\ 3 & -2 & 2 \\ -2 & -2 & 3 \end{pmatrix}$, then $\det(A) =$

Select one:
- a. 1 ✔
- b. 9
- c. 7
- d. 0

The correct answer is: 1

Question **3**
Correct
Mark 1.00 out of 1.00

The adjoint of the matrix $\begin{pmatrix} 4 & 1 \\ 2 & -1 \end{pmatrix}$ is

Select one:
- a. $\begin{pmatrix} -1 & -1 \\ -2 & 4 \end{pmatrix}$ ✔
- b. $\begin{pmatrix} -1 & -2 \\ -3 & -5 \end{pmatrix}$
- c. $\begin{pmatrix} 4 & -1 \\ -2 & -1 \end{pmatrix}$
- d. $\begin{pmatrix} -1 & 2 \\ 1 & -4 \end{pmatrix}$

The correct answer is: $\begin{pmatrix} -1 & -1 \\ -2 & 4 \end{pmatrix}$

Question **4**

Correct

Mark 1.00 out of 1.00

If $A = \begin{pmatrix} 1 & 4 & -1 \\ 2 & 9 & 2 \\ -3 & -12 & 3 \end{pmatrix}$ then the lower triangular matrix L in the LU-facrorization of A is given by

Select one:

a. $L = \begin{pmatrix} 1 & 0 & 0 \\ 2 & 1 & 0 \\ -3 & 0 & 1 \end{pmatrix}$ ✔

b. $L = \begin{pmatrix} 1 & 0 & 0 \\ 2 & 1 & 0 \\ -3 & 0 & 0 \end{pmatrix}$

c. $L = \begin{pmatrix} 1 & 0 & 0 \\ -2 & 1 & 0 \\ 3 & 0 & 1 \end{pmatrix}$

d. $L = \begin{pmatrix} 1 & 0 & 0 \\ -2 & 1 & 0 \\ 3 & 0 & 0 \end{pmatrix}$

The correct answer is: $L = \begin{pmatrix} 1 & 0 & 0 \\ 2 & 1 & 0 \\ -3 & 0 & 1 \end{pmatrix}$

Question **5**

Correct

Mark 1.00 out of 1.00

Any two $n \times n$-singular matrices are row equivalent.

Select one:

a. True

b. False ✔

The correct answer is: False

Question **6**

Correct

Mark 1.00 out of 1.00

If A is a nonsingular and symmetric matrix, then

Select one:

a. A^{-1} is singular and symmetric

b. A^{-1} is singular and not symmetric

c. A^{-1} is nonsingular and symmetric ✔

d. A^{-1} is nonsingular and not symmetric

The correct answer is: A^{-1} is nonsingular and symmetric

Question **7**

Correct

Mark 1.00 out of 1.00

If $AB = AC$, and $|A| \neq 0$, then

Select one:

a. $B \neq C$

b. $A = 0$

c. $A = C$

d. $B = C$.

The correct answer is: $B = C$.

Question **8**

Incorrect

Mark 0.00 out of 1.00

If A, B are $n \times n$ symmetric matrices then AB is symmetric.

Select one:

a. False

b. True

The correct answer is: False

Question **9**

Correct

Mark 1.00 out of 1.00

If y, z are solutions to $Ax = b$, then $y + z$ is a solution of the system $Ax = 0$.

Select one:

a. False

b. True

The correct answer is: False

Question **10**

Correct

Mark 1.00 out of 1.00

Let $A = \begin{pmatrix} 1 & 1 & 0 \\ 1 & a & 1 \\ 1 & 1 & 2 \end{pmatrix}$. the value(s) of a that make A nonsingular

Select one:

a. $a \neq \frac{1}{2}$

b. $a = 1$

c. $a = \frac{1}{2}$

d. $a \neq 1$

The correct answer is: $a \neq 1$

Question **11**

Incorrect

Mark 0.00 out of 1.00

If A, B are $n \times n$-skew-symmetric matrices(A is skew symmetric if $A^T = -A$), then $AB + BA$ is symmetric

Select one:

a. True

b. False

The correct answer is: True

Question **12**

Correct

Mark 1.00 out of 1.00

If A is a singular matrix, then A^T is also singular.

Select one:

- a. True ✔
- b. False

The correct answer is: True

Question **13**

Correct

Mark 1.00 out of 1.00

If A is a 4×3-matrix, $b \in \mathbb{R}^4$, and the system $Ax = b$ is consistent, then $Ax = b$ has a unique solution.

Select one:

- a. True
- b. False ✔

The correct answer is: False

Question **14**

Correct

Mark 1.00 out of 1.00

If A is a 4×4-matrix and $x = \begin{pmatrix} 2 \\ 3 \\ 0 \\ 1 \end{pmatrix}$ is a solution to the system $Ax = 0$, then A is singular.

Select one:

- a. False
- b. True ✔

The correct answer is: True

Question **15**

Correct

Mark 1.00 out of 1.00

If A and B are $n \times n$ matrices such that $Ax \neq Bx$ for all nonzero $x \in \mathbb{R}^n$. Then

Select one:

- a. $A - B$ is singular.
- b. A and B are nonsingular.
- c. $A - B$ is nonsingular. ✔
- d. A and B are singular.

The correct answer is: $A - B$ is nonsingular.

Question **16**

Correct

Mark 1.00 out of 1.00

If $A = \begin{pmatrix} 1 & -2 & 5 \\ 4 & -11 & 8 \\ -3 & 3 & -27 \end{pmatrix}$ and $b = \begin{pmatrix} b_1 \\ b_2 \\ b_3 \end{pmatrix}$, then the system $Ax = b$ is consistent if and only if

Select one:

- a. $7b_1 - b_2 + b_3 \neq 1$
- b. $7b_1 - b_2 + b_3 \neq 0$
- c. $7b_1 - b_2 + b_3 = 1$
- d. $7b_1 - b_2 + b_3 = 0$ ✔

The correct answer is: $7b_1 - b_2 + b_3 = 0$

Question **17**

Correct

Mark 1.00 out of 1.00

Any two $n \times n$-nonsingular matrices are row equivalent.

Select one:

- a. False
- b. True ✔

The correct answer is: True

Question **18**

Correct

Mark 1.00 out of 1.00

A square matrix A is nonsingular iff its RREF (reduced row echelon form) is the identity matrix.

Select one:

- a. True ✔
- b. False

The correct answer is: True

Question **19**

Correct

Mark 1.00 out of 1.00

If the row echelon form of $(A|b)$ is $\begin{pmatrix} 1 & 0 & -2 & -1 & | & -2 \\ 0 & 1 & 1 & -1 & | & -1 \\ 0 & 0 & 1 & 1 & | & 0 \end{pmatrix}$ then the general form of the solutions is given by

Select one:

a. $x = \begin{pmatrix} -2-\alpha \\ 1-\alpha \\ \alpha \\ \alpha \end{pmatrix}$

b. $x = \begin{pmatrix} -2-\alpha \\ -1+2\alpha \\ -\alpha \\ \alpha \end{pmatrix}$ ✔

c. $x = \begin{pmatrix} \alpha \\ 2-\alpha \\ \alpha \\ \alpha \end{pmatrix}$

d. $x = \begin{pmatrix} -2-\alpha \\ 1-\alpha \\ \alpha \\ 1 \end{pmatrix}$

The correct answer is: $x = \begin{pmatrix} -2-\alpha \\ -1+2\alpha \\ -\alpha \\ \alpha \end{pmatrix}$

Question **20**

Incorrect

Mark 0.00 out of 1.00

If A is a 3×3 matrix with $\det(A) = -1$. Then $\det(adj(A)) =$

Select one:

a. 3. ✖

b. 1.

c. -1.

d. -3.

The correct answer is: 1.

Question **21**

Correct

Mark 1.00 out of 1.00

If A is a 3×3 matrix such that $det(A) = 2$, then $\det(3A) = 6$

Select one:

a. True

b. False ✔

The correct answer is: False

Question **22**

Correct

Mark 1.00 out of 1.00

If A is a 3×5 matrix, then the system $Ax = 0$

Select one:

- a. is inconsistent
- b. has infinitely many solutions
- c. has no solution.
- d. has only the zero solution

The correct answer is: has infinitely many solutions

Question **23**

Correct

Mark 1.00 out of 1.00

Let U be an $n \times n$-matrix in reduced row echelon form and $U \neq I$, then

Select one:

- a. $\det(U) = 1$
- b. The system $Ux = 0$ has only the zero solution.
- c. U is the zero matrix
- d. The system $Ux = 0$ has infinitely many solutions

The correct answer is: The system $Ux = 0$ has infinitely many solutions

Question **24**

Incorrect

Mark 0.00 out of 1.00

Let A be a 3×3-matrix with $a_1 = a_2$. If $b = a_2 - a_3$, where a_1, a_2, a_3 ar the columns of A, then a solution to the system $Ax = b$ is

Select one:

- a. $x = \begin{pmatrix} 1 \\ 0 \\ -1 \end{pmatrix}$
- b. $x = \begin{pmatrix} 1 \\ 1 \\ -1 \end{pmatrix}$
- c. $x = \begin{pmatrix} 1 \\ 1 \\ 0 \end{pmatrix}$
- d. $x = \begin{pmatrix} 0 \\ 0 \\ 2 \end{pmatrix}$

The correct answer is: $x = \begin{pmatrix} 1 \\ 0 \\ -1 \end{pmatrix}$

Question **25**

Correct

Mark 1.00 out of 1.00

If A is an $n \times n$ matrix and the system $Ax = b$ has infinitely many solutions, then

Select one:

- a. A is nonsingular
- b. A has a row of zeros
- c. A is symmetric
- d. A singular ✔

The correct answer is: A singular

Question **26**

Correct

Mark 1.00 out of 1.00

Let A be a 4×4-matrix such that $A \begin{bmatrix} 1 \\ 2 \\ 3 \\ 4 \end{bmatrix} = \begin{bmatrix} 0 \\ 0 \\ 0 \\ 0 \end{bmatrix}$, then

Select one:

- a. A is the zero matrix
- b. A is singular. ✔
- c. The system $Ax = 0$ has only one solution
- d. There are elementary matrices $E_1, E_2, \cdots, E_k$ such that $A = E_1 E_2 \cdots E_k$

The correct answer is: A is singular.

Question **27**

Incorrect

Mark 0.00 out of 1.00

If B is a 3×3 nonsingular matrix such that $B^3 = B$, then one of the following is always true

Select one:

- a. $B^4 = B$.
- b. $\det(B) = 1$. ✖
- c. $B = 0$.
- d. $B = B^{-1}$.

The correct answer is: $B = B^{-1}$.

Question **28**

Incorrect

Mark 0.00 out of 1.00

If A is a singular $n \times n$-matrix, $b \in \mathbb{R}^n$, then the system $Ax = b$

Select one:

- a. is inconsistent
- b. has a unique solution ✖
- c. has infinitely many solutions.
- d. has either no solution or an infinite number of solutions

The correct answer is: has either no solution or an infinite number of solutions

Question 29

Correct

Mark 1.00 out of 1.00

Let $A = \begin{pmatrix} 1 & 2 & 3 & 0 \\ 1 & 1 & 2 & 1 \\ 2 & 3 & 5 & 1 \end{pmatrix}$ and $b = \begin{pmatrix} 2 \\ 1 \\ 4 \end{pmatrix}$. The system $Ax = b$

Select one:

- a. has exactly three solutions.
- b. has a unique solution
- c. is inconsistent ✔
- d. has infinitely many solutions

The correct answer is: is inconsistent

Question 30

Correct

Mark 1.00 out of 1.00

Let $(1,2,0)^T$ and $(2,1,1)^T$ be the first two columns of a 3×3 matrix A and $(1,1,1)^T$ be a solution of the system $Ax = (2,1,-1)^T$. Then the third column of the matrix A is

Select one:

- a. $(1,2,2)^T$.
- b. $(-1,-2,-2)^T$. ✔
- c. $(4,-1,1)^T$.
- d. $(1,1,0)^T$.

The correct answer is: $(-1,-2,-2)^T$.

Started on	Monday, 19 October 2020, 10:01 AM
State	Finished
Completed on	Monday, 19 October 2020, 10:31 AM
Time taken	30 mins 1 sec
Marks	23.00/25.00
Grade	**9.20** out of 10.00 (**92**%)

Question **1**
Correct
Mark 2.00 out of 2.00

If a matrix A is row equivalent to I, then A is nonsingular.

Select one:
- a. True ✔
- b. False

Question **2**
Correct
Mark 2.00 out of 2.00

If a matrix A is nonsingular, then the matrix A^T is also nonsingular.

Select one:
- a. True ✔
- b. False

Question **3**
Correct
Mark 2.00 out of 2.00

If A and B are $n \times n$ nonsingular matrices, then AB is also nonsingular.

Select one:
- a. True ✔
- b. False

Question **4**
Correct
Mark 2.00 out of 2.00

If $Ax = b$ is an overdetermined and consistent linear system, then it must have infinitely many solutions.

Select one:
- a. True
- b. False ✔

Question **5**
Correct
Mark 2.00 out of 2.00

Let A be a 3×3 matrix and suppose that $A \begin{bmatrix} 1 \\ 0 \\ 0 \end{bmatrix} = \begin{bmatrix} 0 \\ 0 \\ 0 \end{bmatrix}$. Then

Select one:
- a. $Ax = 0 <$ has infinitely many solutions ✔
- b. $Ax = (1, 0, 0)^T$ has infinitely many solutions
- c. A is nonsingular
- d. None of the above

Question **6**
Correct
Mark 2.00 out of 2.00

If a matrix is in row echelon form, then it is also in reduced row echelon form.

Select one:
- a. True
- b. False ✔

b. False ✔

Question 7
Correct
Mark 3.00 out of 3.00

If $(A|b) = \left[\begin{array}{ccc|c} 1 & 0 & 2 & 1 \\ -1 & 1 & -1 & 0 \\ -1 & 0 & \alpha & \beta \end{array}\right]$ is the augmented matrix of the system $Ax = b$. Answer the following questions.

The system has no solution if

- $\alpha = -2$ and $\beta \neq -1$ ✔
- $\alpha = -2$ and $\beta = -1$
- $\alpha \neq -2$ and $\beta \neq -1$
- $\alpha \neq -2$ and $\beta = -1$

The system has exactly one solution if

- $\alpha = -2$ and $\beta = -1$
- $\alpha \neq -2$ ✔
- $\alpha = -2$
- $\alpha \neq -2$ and $\beta \neq -1$

The system has infinitely many solutions if

- $\alpha \neq -2$ and $\beta \neq -1$
- $\alpha = -2$ and $\beta \neq -1$
- $\alpha = -2$ and $\beta = -1$ ✔
- $\alpha \neq -2$ and $\beta = -1$

Question 8
Correct
Mark 2.00 out of 2.00

Let $A = \begin{bmatrix} 1 & 2 & 1 \\ -1 & 1 & 0 \\ 1 & 8 & 1 \end{bmatrix}$. If we want to find the LU factorization of A, then $L =$

Select one:

a. $\begin{bmatrix} 1 & 0 & 0 \\ -1 & 1 & 0 \\ 1 & 2 & 1 \end{bmatrix}$ ✔

b. $\begin{bmatrix} 1 & 0 & 0 \\ -1 & 1 & 0 \\ 1 & 8 & 1 \end{bmatrix}$

c. $\begin{bmatrix} 1 & 0 & 0 \\ 1 & 1 & 0 \\ -1 & -2 & 1 \end{bmatrix}$

d. $\begin{bmatrix} 1 & 0 & 0 \\ 1 & 1 & 0 \\ -1 & -8 & 1 \end{bmatrix}$

Question 9
Incorrect
Mark 0.00 out of 2.00

A homogeneous system can have a nontrivial solution.

Select one:

a. True

b. False ✖

Question 10
Correct
Mark 2.00 out of 2.00

The inverse of an elementary matrix is also an elementary matrix.

Select one:

a. True ✔

b. False

Question **11**
Correct
Mark 2.00 out of 2.00

If a system of linear equations is undetermined, then it must have infinitely many solutions.

Select one:
- a. True
- b. False ✔

Question **12**
Correct
Mark 2.00 out of 2.00

The sum of two $n \times n$ nonsingular matrices is also nonsingular.

Select one:
- a. True
- b. False ✔

Started on Monday, 19 October 2020, 5:39 PM
State Finished
Completed on Monday, 19 October 2020, 5:57 PM
Time taken 18 mins 13 secs
Grade **10** out of 10 (**100**%)

Question **1**
Correct
Mark 1 out of 1

If $AB = 0$, where A and B are $n \times n$ matrices. Then

Select one:
- a. either A or B is singular ✔
- b. either $A = 0$ or $B = 0$
- c. both A, B are singular.
- d. both A, B are nonsingular.

The correct answer is: either A or B is singular

Question **2**
Correct
Mark 1 out of 1

If A, B, C are $n \times n$-matrices with $AB = AC$, then $B = C$

Select one:
- a. False ✔
- b. True

The correct answer is: False

Question **3**
Correct
Mark 1 out of 1

The sum of two elementary matrices is elementary

Select one:
- a. False ✔
- b. True

The correct answer is: False

Question **4**
Correct
Mark 1 out of 1

If A, B are $n \times n$-symmetric matrices, then $AB - BA$ is skew symmetric

Select one:
- a. False
- b. True ✔

The correct answer is: True

Question **5**
Correct
Mark 1 out of 1

In the square linear system $Ax = b$, if A is singular and b is a linear combination of the columns of A then the system has

Select one:
- a. no solution
- b. infinitely many solutions ✔
- c. a unique solution
- d. can not tell

The correct answer is: infinitely many solutions

Question **6**
Correct
Mark 1 out of 1

If A is a 3×3-matrix and the system $Ax = \begin{pmatrix} 5 \\ 1 \\ 3 \end{pmatrix}$ has a unique solution, then the system $Ax = \begin{pmatrix} 0 \\ 0 \\ 0 \end{pmatrix}$

Select one:
- a. has infinitely many solutions
- b. none of the above
- c. is inconsistent
- d. has only the zero solution. ✔

The correct answer is: has only the zero solution.

Question **7**
Correct
Mark 1 out of 1

If $(A|b) = \begin{pmatrix} 1 & 2 & 1 & -1 & | & 0 \\ 2 & 3 & 1 & 1 & | & -1 \\ 0 & 1 & 1 & \alpha & | & \beta \end{pmatrix}$, then the system is inconsistent if

Select one:
- a. $\alpha = -3$ and $\beta = 1$
- b. $\alpha \neq -3$ and $\beta \neq 1$
- c. $\alpha = -3$ and $\beta \neq 1$
  ✔
- d. $\alpha \neq -3$ and β any number

The correct answer is: $\alpha = -3$ and $\beta \neq 1$

Question **8**
Correct
Mark 1 out of 1

If y, z are solutions to $Ax = b$, then $y - z$ is a solution of the system $Ax = 0$.

Select one:
- a. True ✔
- b. False

The correct answer is: True

Question 9
Correct
Mark 1 out of 1

If A is a 3×4-matrix, and $b = a_2$ (second column of A), then a solution to the system $Ax = b$ is

Select one:

a. $x = \begin{pmatrix} 0 \\ 1 \\ 0 \\ 0 \end{pmatrix}$

b. $x = \begin{pmatrix} 1 \\ 0 \\ 0 \end{pmatrix}$

c. $x = \begin{pmatrix} 1 \\ 0 \\ 0 \\ 0 \end{pmatrix}$

d. $x = \begin{pmatrix} 0 \\ 1 \\ 0 \end{pmatrix}$

The correct answer is: $x = \begin{pmatrix} 0 \\ 1 \\ 0 \\ 0 \end{pmatrix}$

Question 10
Correct
Mark 1 out of 1

If B is a 3×3 matrix such that $B^2 = B$. One of the following is always true

Select one:

a. $B^5 = B$.

b. $B = 0$.

c. $B = I$.

d. B is nonsingular.

The correct answer is: $B^5 = B$.

Started on	Sunday, 6 June 2021, 4:00 PM
State	Finished
Completed on	Sunday, 6 June 2021, 4:13 PM
Time taken	12 mins 56 secs
Grade	**5** out of 6 (**83**%)

Question **1**

Correct

Mark 1 out of 1

The rank of $A = \begin{pmatrix} 1 & 4 & 1 & 2 & 1 \\ 2 & 6 & -1 & 2 & -1 \\ 3 & 10 & 0 & 4 & 0 \end{pmatrix}$ is

Select one:

a. 0

b. 3

c. 1

d. 2 ✔

The correct answer is: 2

Question **2**

Incorrect

Mark 0 out of 1

If A is a 3×4 matrix, then

Select one:

a. The columns of A are linearly independent

b. The rows of A are linearly dependent

c. nullity$(A) \geq 1$

d. $Rank(A) = 3$ ✖

The correct answer is: nullity$(A) \geq 1$

Question **3**

Correct

Mark 1 out of 1

Let $E = [2+x, 1-x, x^2+1]$ be an ordered basis for P_3. If $p(x) = 3x^2 + 5x + 4$, then the coordinate vector of $p(x)$ with respect to E is

Select one:

- a. $pmatrix3$
  5
  $4[\backslash\mathrm{end?}]pmatrix$
- b. $pmatrix3$
  -3
  $2[\backslash\mathrm{end?}]pmatrix$
- c. $pmatrix3$
  2
  $-3[\backslash\mathrm{end?}]pmatrix$
- d. $pmatrix2$
  -3
  $3[\backslash\mathrm{end?}]pmatrix$

The correct answer is: $pmatrix2$
-3
$3[\backslash\mathrm{end?}]pmatrix$

Question **4**

Correct

Mark 1 out of 1

If A is a 5×7 matrix, then nullity of $A \geq 2$.

Select one:

- a. False
- b. True

The correct answer is: True

Question **5**

Correct

Mark 1 out of 1

If A is an $n \times n$-matrix and for each $b \in \mathbb{R}^n$ the system $Ax = b$ has a unique solution, then

Select one:

- a. A is singular
- b. A is nonsingular ✔
- c. nullity$(A) = 1$
- d. rank$(A) = n - 1$

The correct answer is: A is nonsingular

Question **6**

Correct

Mark 1 out of 1

let A be a 4×7-matrix, if the row echelon form of A has 2 nonzero rows, then dim(column space of A) is

Select one:

- a. 5
- b. 2 ✔
- c. 3
- d. 6

The correct answer is: 2

Jump to...

Quiz 3 ►

Data retention summary

Started on	Sunday, 11 April 2021, 8:33 AM
State	Finished
Completed on	Sunday, 11 April 2021, 9:03 AM
Time taken	30 mins
Grade	**8.00** out of 12.00 (**67**%)

Question **1**

Incorrect

Mark 0.00 out of 1.00

If x_1, x_2 are solutions to $Ax = b$, then $x_1 - x_2$ is a solution of the system $Ax = b$.

Select one:

a. False

b. True

The correct answer is: False

Question **2**

Correct

Mark 1.00 out of 1.00

If E is an elementary matrix of type III, then det$(E) = -1$

Select one:

a. False

b. True

The correct answer is: False

Question **3**

Incorrect

Mark 0.00 out of 1.00

If $AB = AC$, and $|A| \neq 0$, then

Select one:

a. $A = C$

b. $B \neq C$

c. $B = C$.

The correct answer is: $B = C$.

Question **4**

Correct

Mark 1.00 out of 1.00

If A is a singular matrix and U is the row echelon form of A, then $\det(U) =$.

Select one:

- a. none of the above
- b. 0 ✔
- c. 1
- d. ± 1

The correct answer is: 0

Question **5**

Correct

Mark 1.00 out of 1.00

If A is a symmetric $n \times n$-matrix and P any $n \times n$-matrix, then $P^T AP$ is

Select one:

- a. not defined
- b. symmetric ✔
- c. singular
- d. not symmetric

The correct answer is: symmetric

Question **6**

Correct

Mark 1.00 out of 1.00

If x_1, x_2 are solutions to $Ax = b$, then $\frac{1}{4}x_1 + \frac{3}{4}x_2$ is a solution of the system $Ax = 0$.

Select one:

- a. False ✔
- b. True

The correct answer is: False

Question **7**

Correct

Mark 1.00 out of 1.00

If A is a nonsingular and symmetric matrix, then

Select one:

- a. A^{-1} is singular and symmetric
- b. A^{-1} is nonsingular and symmetric ✔
- c. A^{-1} is singular and not symmetric
- d. A^{-1} is nonsingular and not symmetric

The correct answer is: A^{-1} is nonsingular and symmetric

Question **8**

Correct

Mark 1.00 out of 1.00

Let $A = pmatrix1\&-1\&1$
$3\&-2\&2$
$-2\&1\&3[\backslash\text{end?}]pmatrix$, then det$(A) =$

Select one:

- a. 4 ✔
- b. 8
- c. 0
- d. 1

The correct answer is: 4

Question **9**

Incorrect

Mark 0.00 out of 1.00

If $A = pmatrix 1 \& -2 \& 5$ $4 \& -5 \& 8$ $-3 \& 3 \& -3[\backslash \mathrm{end}?]pmatrix$ and $b = pmatrix b_1$ b_2 $b_3[\backslash \mathrm{end}?]pmatrix$, then the system $Ax = b$ is consistent if and only if

Select one:

- a. $b_3 + b_1 + b_2 = 0$ ✖
- b. $b_2 - b_1 - b_3 = 0$
- c. $b_1 - b_2 - b_3 = 0$
- d. $b_3 - b_1 - b_2 = 0$

The correct answer is: $b_1 - b_2 - b_3 = 0$

Question **10**

Correct

Mark 1.00 out of 1.00

Let $(1,2,0)^T$ and $(2,1,1)^T$ be the first two columns of a 3×3 matrix A and $(1,1,1)^T$ be a solution of the system $Ax = (4,2,5)^T$. Then the third column of the matrix A is

Select one:

- a. $(1,-1,-4)^T$.
- b. $(1,-1,4)^T$. ✔
- c. $(1,1,4)^T$.
- d. $(4,-1,1)^T$.

The correct answer is: $(1,-1,4)^T$.

Question **11**

Correct

Mark 1.00 out of 1.00

If A is row equivalent to B, then $\det(A) = \det(B)$.

Select one:

- a. True
- b. False

The correct answer is: False

Question **12**

Incorrect

Mark 0.00 out of 1.00

If A is a nonsingular $n \times n$-matrix, then

Select one:

- a. The system $Ax = 0$ has a nontrivial (nonzero) solutions.
- b. There is an elementary matrix E such that $A = E$.
- c. $\det(A) = 1$
- d. There is a nonsingular matrix B such that $AB = I$.

The correct answer is: There is a nonsingular matrix B such that $AB = I$.

◄ Quiz 3

Jump to...

Quiz 1 (chapter one) ►

Data retention summary

Started on	Saturday, 29 May 2021, 5:00 PM
State	Finished
Completed on	Saturday, 29 May 2021, 5:15 PM
Time taken	15 mins 1 sec
Grade	**4** out of 6 (**67**%)

Question **1**
Incorrect
Mark 0 out of 1

Every linearly independent set of vectors in $\mathbb{R}^4$ has exactly 4 vectors.

Select one:
- a. False
- b. True ✗

The correct answer is: False

Question **2**
Correct
Mark 1 out of 1

If $\{v_1, v_2, v_3, v_4\}$ forms a spanning set for a vector space V, v_4 can be written as a linear combination of v_1, v_2, v_3, then

Select one:
- a. $\{v_1, v_2, v_3\}$ is a spanning set of V. ✓
- b. $\{v_1, v_2, v_3\}$ is not a spanning set of V.
- c. $\{v_1, v_2, v_3\}$ are linearly dependent in V.
- d. $\{v_1, v_2, v_3\}$ are linearly independent in V.

The correct answer is: $\{v_1, v_2, v_3\}$ is a spanning set of V.

Question **3**

Incorrect

Mark 0 out of 1

dim$\left(\text{span}(x^2, 3 + x^2, x^2 + 1)\right)$ is

Select one:

- a. 1
- b. 3
- c. 0
- d. 2

The correct answer is: 2

Question **4**

Correct

Mark 1 out of 1

If V is a vector space and $\{v_1, v_2, \cdots, v_n\}$ is a spanning set for V and $v_{n+1} \in V$, then the set $\{v_1, v_2, \cdots, v_{n+1}\}$ is

Select one:

- a. not a spanning set.
- b. a spanning set.

The correct answer is: a spanning set.

Question **5**

Correct

Mark 1 out of 1

Let V be a vector space of dimension 4 and $W = \{v_1, v_2, v_3, v_4, v_5\}$ a set of nonzero vectors of V, then

Select one:

- a. W is a spanning set
- b. W is a basis
- c. W is linearly dependent
- d. W is linearly independent

The correct answer is: W is linearly dependent

Question 6

Correct

Mark 1 out of 1

The vectors $\{(1,-1,1)^T,(1,-3,2)^T,(1,-2,0)^T\}$ in $\mathbb{R}^3$ are

Select one:

a. linearly dependent

b. linearly independent ✔

The correct answer is: linearly independent

◀ Quiz 4 (6-6-2021)

Jump to...

Short Exam 1 ▶

Dashboard / My courses / INTRODUCTION TO LINEAR ALGEBRA-Lecture-1202 - MATH234 - 4 / General / Quiz 4 (6-6-2021)

Started on	Sunday, 6 June 2021, 4:00 PM
State	Finished
Completed on	Sunday, 6 June 2021, 4:13 PM
Time taken	12 mins 56 secs
Grade	**5** out of 6 (**83**%)

Question **1**

Correct

Mark 1 out of 1

The rank of $A = \begin{pmatrix} 1 & 4 & 1 & 2 & 1 \\ 2 & 6 & -1 & 2 & -1 \\ 3 & 10 & 0 & 4 & 0 \end{pmatrix}$ is

Select one:

- a. 0
- b. 3
- c. 1
- d. 2 ✔

The correct answer is: 2

Question **2**

Incorrect

Mark 0 out of 1

If A is a 3×4 matrix, then

Select one:

- a. The columns of A are linearly independent
- b. The rows of A are linearly dependent
- c. nullity$(A) \geq 1$
- d. $Rank(A) = 3$ ✖

The correct answer is: nullity$(A) \geq 1$

Question **3**

Correct

Mark 1 out of 1

Let $E=[2+x,1-x,x^2+1]$ be an ordered basis for P_3. If $p(x)=3x^2+5x+4$, then the coordinate vector of $p(x)$ with respect to E is

Select one:

- a. $pmatrix3$
  5
  $4[\backslash\text{end?}]pmatrix$
- b. $pmatrix3$
  -3
  $2[\backslash\text{end?}]pmatrix$
- c. $pmatrix3$
  2
  $-3[\backslash\text{end?}]pmatrix$
- d. $pmatrix2$
  -3
  $3[\backslash\text{end?}]pmatrix$ ✔

The correct answer is: $pmatrix2$
-3
$3[\backslash\text{end?}]pmatrix$

Question **4**

Correct

Mark 1 out of 1

If A is a 5×7 matrix, then nullity of $A \geq 2$.

Select one:

- a. False
- b. True ✔

The correct answer is: True

Question **5**
Correct
Mark 1 out of 1

If A is an $n \times n$-matrix and for each $b \in \mathbb{R}^n$ the system $Ax = b$ has a unique solution, then

Select one:
- a. A is singular
- b. A is nonsingular ✔
- c. nullity$(A) = 1$
- d. rank$(A) = n - 1$

The correct answer is: A is nonsingular

Question **6**
Correct
Mark 1 out of 1

let A be a 4×7-matrix, if the row echelon form of A has 2 nonzero rows, then dim(column space of A) is

Select one:
- a. 5
- b. 2 ✔
- c. 3
- d. 6

The correct answer is: 2

Jump to...

Quiz 3 ►

Started on	Sunday, 9 May 2021, 11:38 AM
State	Finished
Completed on	Sunday, 9 May 2021, 1:03 PM
Time taken	1 hour 24 mins
Grade	**25** out of 32 (**78**%)

Question **1**
Correct
Mark 1 out of 1

If A is nonsingular and B is singular $n \times n$-matrices, then AB is

Select one:
- a. may or may not be singular
- b. singular ✔
- c. nonsingular

The correct answer is: singular

Question **2**
Correct
Mark 1 out of 1

One of the follwoing sets is a subspace of P_4

Select one:
- a. $S = \{f(x) \in P_4 : f(0) = 1\}$
- b. $S = \{f(x) \in P_4 : f(1) = 1\}$
- c. $S = \{f(x) \in P_4 : f(0) = 0, \text{and } f'(0) = 2\}$
- d. $S = \{f(x) \in P_4 : f(1) = 0\}$ ✔

The correct answer is: $S = \{f(x) \in P_4 : f(1) = 0\}$

Question **3**

Incorrect

Mark 0 out of 1

If A is a 3×3 matrix with $\det(A)=2$. Then $\det(adj(A))=$

Select one:

- a. -2.
- b. -8.
- c. 4.
- d. 8.

The correct answer is: 4.

Question **4**

Incorrect

Mark 0 out of 1

Let $S=\left\{\begin{matrix} pmatrix x \\ y[\backslash end?]pmatrix \in \mathbb{R}^2 : x^2+y^2=0\end{matrix}\right\}$, then S is a subspace of $\mathbb{R}^2$.

Select one:

- a. True
- b. False

The correct answer is: True

Question **5**

Incorrect

Mark 0 out of 1

If the row echelon form of $(A|b)$ is $pmatrix 1\&0\&-2\&-1\&|\&-2$
$0\&1\&1\&-1\&|\&-1$
$0\&0\&1\&1\&|\&1[\backslash\mathrm{end?}]pmatrix$ then the general form of the solutions is given by

Select one:

a. $x = pmatrix -2-\alpha$
$1-\alpha$
α
$1[\backslash\mathrm{end?}]pmatrix$

b. $x = pmatrix\,\alpha$
$2-\alpha$
α
$\alpha[\backslash\mathrm{end?}]pmatrix$

c. $x = pmatrix -2-\alpha$
$-1+2\alpha$
$-\alpha$
$\alpha[\backslash\mathrm{end?}]pmatrix$ ✖

d. $x = pmatrix -\alpha$
$-2+2\alpha$
$1-\alpha$
$\alpha[\backslash\mathrm{end?}]pmatrix$

The correct answer is: $x = pmatrix -\alpha$
$-2+2\alpha$
$1-\alpha$
$\alpha[\backslash\mathrm{end?}]pmatrix$

Question **6**

Correct

Mark 1 out of 1

Let $(1,2,0)^T$ and $(2,1,1)^T$ be the first two columns of a 3×3 matrix A and $(1,1,1)^T$ be a solution of the system $Ax = (4,4,5)^T$. Then the third column of the matrix A is

Select one:

- a. $(1,1,4)^T$. ✔
- b. $(2,1,1)^T$.
- c. $(1,-1,4)^T$.
- d. $(4,-1,1)^T$.

The correct answer is: $(1,1,4)^T$.

Question **7**

Correct

Mark 1 out of 1

Let $A = \begin{matrix} pmatrix1\&1\&2 \\ 0\&a\&3 \\ 2\&0\&a-1 \\ [\backslash end?]pmatrix \end{matrix}$. Then the values of a that make A singular are

Select one:

- a. $a = 2,3$ ✔
- b. $a = 0$
- c. $a = 1,2$
- d. $a = 1,0$

The correct answer is: $a = 2,3$

Question **8**

Incorrect

Mark 0 out of 1

The vectors $\{x+1, 2x^2+x+3, x^2+x+2\}$ form a spanning set for P_3.

Select one:

- a. True ✗
- b. False

The correct answer is: False

Question **9**

Correct

Mark 1 out of 1

If A is a nonsingular 3×3-matrix, then the reduced row echelon form of A has no row of zeros.

Select one:

- a. False
- b. True ✓

The correct answer is: True

Question **10**

Correct

Mark 1 out of 1

If $(A|b) = pmatrix 1 \& -1 \& -1 \& | \& 2$
$-2 \& 3 \& 1 \& | \& -1$
$1 \& 1 \& \alpha \& | \& \beta [\backslash end?] pmatrix$, then the system has infinite number of solutions if and only if

Select one:

- a. $\alpha \neq -3$ and $\beta \neq 8$
- b. $\alpha \neq -3$ and β any number
- c. $\alpha = -3$ and $\beta = 8$ ✓
- d. $\alpha = -3$ and $\beta \neq 8$

The correct answer is: $\alpha = -3$ and $\beta = 8$

Question **11**

Incorrect

Mark 0 out of 1

In the linear system $Ax = b$, if $b = a_1 = a_2 + 3a_4$ then the system $Ax = b$ has infinite solutions.

Select one:

- a. True
- b. False

The correct answer is: True

Question **12**

Correct

Mark 1 out of 1

The adjoint of the matrix $\begin{pmatrix} arraycc-1\&1 \\ 2\&4[\backslash \mathrm{end}?]array \end{pmatrix}$ is

Select one:

- a. $\begin{pmatrix} arraycc4\&-1 \\ -2\&-1[\backslash \mathrm{end}?]array \end{pmatrix}$
- b. $\begin{pmatrix} arraycc-1\&2 \\ 1\&-4[\backslash \mathrm{end}?]array \end{pmatrix}$
- c. $\begin{pmatrix} arraycc-1\&-1 \\ -2\&4[\backslash \mathrm{end}?]array \end{pmatrix}$
- d. $\begin{pmatrix} arraycc-1\&-2 \\ -3\&-5[\backslash \mathrm{end}?]array \end{pmatrix}$

The correct answer is: $\begin{pmatrix} arraycc4\&-1 \\ -2\&-1[\backslash \mathrm{end}?]array \end{pmatrix}$

Question **13**

Correct

Mark 1 out of 1

The product of two elementary matrices is elementary

Select one:

- a. True
- b. False

The correct answer is: False

Question **14**

Correct

Mark 1 out of 1

If x_0 is a solution for the nonhomogeneous system $Ax=b$ and x_1 is a solution of the homogeneous system $Ax=0$. Then x_1+x_0 is a solution for

Select one:

- a. the system $Ax=2b$
- b. the system $Ax=b$ ✔
- c. the system $Ax=0$
- d. the system $Ax=Ab$

The correct answer is: the system $Ax=b$

Question **15**

Correct

Mark 1 out of 1

If A,B are $n\times n$ nonsingular matrices, then $A^2-B^2=(A+B)(A-B)$.

Select one:

- a. True
- b. False ✔

The correct answer is: False

Question **16**

Correct

Mark 1 out of 1

If A is a singular matrix, then A can be written as a product of elementary matrices.

Select one:

- a. True
- b. False ✔

The correct answer is: False

Question 17
Correct
Mark 1 out of 1

$S=\{A\in\mathbb{R}^{3\times3}: A \text{ is upper triangular}\}$ is a subspace of $\mathbb{R}^{3\times3}$

Select one:
- a. True
- b. False

The correct answer is: True

Question 18
Correct
Mark 1 out of 1

If A is a nonsingular $n\times n$ matrix, $b\in\mathbb{R}^n$, then

Select one:
- a. The system $Ax=b$ has only two solutions
- b. The system $Ax=b$ is inconsistent
- c. The system $Ax=b$ has infinitely many solutions
- d. The system $Ax=b$ has a unique solution

The correct answer is: The system $Ax=b$ has a unique solution

Question 19
Correct
Mark 1 out of 1

Let U be an $n\times n$-matrix in reduced row echelon form and $U\neq I$, then

Select one:
- a. U is the zero matrix
- b. The system $Ux=0$ has infinitely many solutions
- c. The system $Ux=0$ has only the zero solution.
- d. $\det(U)=1$

The correct answer is: The system $Ux=0$ has infinitely many solutions

Question **20**

Correct

Mark 1 out of 1

If A is a 4×4-matrix and $x = pmatrix2$
3
0
$1[\backslash\text{end?}]pmatrix$ is a solution to the system $Ax=0$, then A is singular.

Select one:

- a. True
- b. False

The correct answer is: True

Question **21**

Incorrect

Mark 0 out of 1

The vectors $\left\{(1,-1,-4)^T,(1,-1,1)^T,(1,-1,2)^T\right\}$ form a spanning set for $\mathbb{R}^3$.

Select one:

- a. False
- b. True

The correct answer is: False

Question **22**

Correct

Mark 1 out of 1

If y, z are solutions to $Ax=b$, then $y-z$ is a solution of the system $Ax=0$.

Select one:

- a. False
- b. True

The correct answer is: True

Question **23**

Correct

Mark 1 out of 1

If E is an elementary matrix of type III, then E^T is

Select one:

- a. an elementary matrix of type III ✔
- b. not an elementary matrix
- c. an elementary matrix of type I
- d. an elementary matrix of type II

The correct answer is: an elementary matrix of type III

Question **24**

Correct

Mark 1 out of 1

If $AB = AC$, and $|A| \neq 0$, then

Select one:

- a. $B \neq C$
- b. $A = C$
- c. $A = 0$
- d. $B = C$. ✔

The correct answer is: $B = C$.

Question **25**

Incorrect

Mark 0 out of 1

If A is a 4×3 matrix such that $N(A) = \{0\}$, and b can be written as a linear combination of the columns of A, then

Select one:

- a. The system $Ax = b$ has exactly two solutions
- b. The system $Ax = b$ is inconsistent
- c. The system $Ax = b$ has infinitely many solutions ✘
- d. The system $Ax = b$ has exactly one solution

The correct answer is: The system $Ax = b$ has exactly one solution

Question **26**

Correct

Mark 1 out of 1

Let V be a vector space, $\{v_1, v_2, \ldots, v_n\}$ a spanning set for V, then the vectors $\{v_1, v_2, \ldots, v_{n-1}\}$ form a spanning set for V.

Select one:

a. False ✔

b. True

The correct answer is: False

Question **27**

Correct

Mark 1 out of 1

Let $A = pmatrix 1 \& -1 \& 1$
$3 \& -2 \& 2$
$-2 \& 3 \& 3 [\backslash end?] pmatrix$, then det$(A) =$

Select one:

a. 7

b. 6 ✔

c. 0

d. 9

The correct answer is: 6

Question **28**

Correct

Mark 1 out of 1

If A is a singular matrix, then A^T is also singular.

Select one:

a. True ✔

b. False

The correct answer is: True

Question **29**

Correct

Mark 1 out of 1

Any two $n \times n$-nonsingular matrices are row equivalent.

Select one:

- a. True
- b. False

The correct answer is: True

Question **30**

Correct

Mark 1 out of 1

If A is a 4×3-matrix, $b \in \mathbb{R}^4$, and the system $Ax = b$ is consistent, then $Ax = b$ has a unique solution.

Select one:

- a. True
- b. False

The correct answer is: False

Question **31**

Correct

Mark 1 out of 1

Any two $n \times n$-singular matrices are row equivalent.

Select one:

- a. True
- b. False

The correct answer is: False

Question **32**

Correct

Mark 1 out of 1

If $(2A)^{-1} = pmatrix3\&2$
$5\&4[\backslash\text{end?}]pmatrix$, then $A =$

Select one:

- a. $pmatrix4\&-2$
  $-5\&3[\backslash\text{end?}]pmatrix$
- b. $pmatrix2\&-1$
  $\frac{-5}{2}\&\frac{3}{2}[\backslash\text{end?}]pmatrix$
- c. $pmatrix1\&\frac{-1}{2}$
  $\frac{-5}{4}\&\frac{3}{4}[\backslash\text{end?}]pmatrix$ ✔
- d. $pmatrix8\&-4$
  $-10\&6[\backslash\text{end?}]pmatrix$

The correct answer is: $pmatrix1\&\frac{-1}{2}$
$\frac{-5}{4}\&\frac{3}{4}[\backslash\text{end?}]pmatrix$

Jump to...

Announcements ▶

Data retention summary

Started on	Sunday, 9 May 2021, 11:30 AM
State	Finished
Completed on	Sunday, 9 May 2021, 12:50 PM
Time taken	1 hour 20 mins
Grade	**30** out of 32 (**94**%)

Question **1**

Correct

Mark 1 out of 1

In the $n \times n$-linear system $Ax = b$, if A is singular and b is a linear combination of the columns of A then the system has

Select one:

- a. no solution
- b. infinitely many solutions ✔
- c. a unique solution
- d. exactly two solutions

The correct answer is: infinitely many solutions

Question **2**

Correct

Mark 1 out of 1

If U, V are subspaces of a vector space W, then

Select one:

- a. $U \cap V$ may or may not be a subspace of W.
- b. $U \cap V$ is a subspace of W. ✔
- c. $U \cup V$ is a subspace of W.

The correct answer is: $U \cap V$ is a subspace of W.

Question **3**

Correct

Mark 1 out of 1

If A and B are $n \times n$ matrices such that $Ax = Bx$ for some nonzero $x \in \mathbb{R}^n$. Then

Select one:

- a. $A - B$ is nonsingular.
- b. $A - B$ is singular. ✔
- c. A and B are singular.
- d. A and B are nonsingular.

The correct answer is: $A - B$ is singular.

Question **4**

Correct

Mark 1 out of 1

Any elementary matrix is nonsingular

Select one:

- a. True ✔
- b. False

The correct answer is: True

Question **5**

Correct

Mark 1 out of 1

In the linear system $Ax = b$, if $b = a_1 = a_2 + 3a_4$ then the system $Ax = b$ has infinite solutions.

Select one:

- a. False
- b. True ✔

The correct answer is: True

Question **6**

Correct

Mark 1 out of 1

If the row echelon form of $(A|b)$ is $\begin{pmatrix} 1 & 0 & -2 & -1 & | & -2 \\ 0 & 1 & 1 & -1 & | & -1 \\ 0 & 0 & 1 & 1 & | & 1 \end{pmatrix}$ then the general form of the solutions is given by

Select one:

- a. $x = \begin{pmatrix} \alpha \\ 2-\alpha \\ \alpha \\ \alpha \end{pmatrix}$
- b. $x = \begin{pmatrix} -\alpha \\ -2+2\alpha \\ 1-\alpha \\ \alpha \end{pmatrix}$ ✔
- c. $x = \begin{pmatrix} -2-\alpha \\ -1+2\alpha \\ -\alpha \\ \alpha \end{pmatrix}$
- d. $x = \begin{pmatrix} -2-\alpha \\ 1-\alpha \\ \alpha \\ 1 \end{pmatrix}$

The correct answer is: $x = \begin{pmatrix} -\alpha \\ -2+2\alpha \\ 1-\alpha \\ \alpha \end{pmatrix}$

Question **7**

Correct

Mark 1 out of 1

Let $U = \left\{ \begin{pmatrix} x \\ y \end{pmatrix} : y = x + 1 \right\}$. Then U is a subspace of $\mathbb{R}^2$

Select one:

- a. True
- b. False ✔

The correct answer is: False

Question **8**

Correct

Mark 1 out of 1

If $(A|b) = \begin{pmatrix} 1 & 1 & 2 & | & 4 \\ 2 & -1 & 2 & | & 6 \\ 0 & 3 & 2 & | & 1 \end{pmatrix}$ is the augmented matrix of the system $Ax = b$ then the system has no solution

Select one:

- (selected) a. True ✔
- b. False

The correct answer is: True

Question **9**

Correct

Mark 1 out of 1

If $A = LU$ is the LU-factorization of a matrix A, and A is singular, then

Select one:

- a. L and U are both singular
- b. L is singular and U is nonsingular
- (selected) c. U is singular and L is nonsingular ✔
- d. L and U are both nonsingular

The correct answer is: U is singular and L is nonsingular

Question **10**

Correct

Mark 1 out of 1

Any two $n \times n$-singular matrices are row equivalent.

Select one:

- a. True
- (selected) b. False ✔

The correct answer is: False

Question **11**

Correct

Mark 1 out of 1

The vectors $\{(1,-1,1)^T,(1,-1,2)^T,(1,-1,1)^T\}$ form a spanning set for $\mathbb{R}^3$.

Select one:

- a. False
- b. True

The correct answer is: False

Question **12**

Correct

Mark 1 out of 1

If A is a 4×4 matrix with $\det(A)=-2$. Then $\det(adj(A))=$

Select one:

- a. $-2.$
- b. $-8.$
- c. $8.$
- d. $2.$

The correct answer is: $-8.$

Question **13**

Correct

Mark 1 out of 1

Let V be a vector space, $\{v_1,v_2,\ldots,v_n\}$ a spanning set for V, then the vectors $\{v_1,v_2,\ldots,v_{n-1}\}$ form a spanning set for V.

Select one:

- a. False
- b. True

The correct answer is: False

Question **14**

Correct

Mark 1 out of 1

If $AB = 0$, where A and B are $n \times n$ nonzero matrices. Then

Select one:

- a. either A or B is nonsingular
- b. either $A = 0$ or $B = 0$
- c. both A, B are singular. ✔
- d. both A, B are nonsingular.

The correct answer is: both A, B are singular.

Question **15**

Correct

Mark 1 out of 1

If y, z are solutions to $Ax = b$, then $\frac{1}{4}y + \frac{3}{4}z$ is a solution of the system $Ax = b$.

Select one:

- a. True ✔
- b. False

The correct answer is: True

Question **16**

Incorrect

Mark 0 out of 1

One of the follwoing sets is a subspace of P_4

Select one:

- a. $S = \{f(x) \in P_4 : f(0) = 1\}$
- b. $S = \{f(x) \in P_4 : f(1) = 0\}$
- c. $S = \{f(x) \in P_4 : f(0) = 0, \text{and } f'(0) = 2\}$ ✘
- d. $S = \{f(x) \in P_4 : f(1) = 1\}$

The correct answer is: $S = \{f(x) \in P_4 : f(1) = 0\}$

Question **17**

Correct

Mark 1 out of 1

If A is a singular matrix, then the system $Ax = b$ has infinite number of solutions

Select one:

- a. False
- b. True

The correct answer is: False

Question **18**

Correct

Mark 1 out of 1

If $(2A)^{-1} = \begin{pmatrix} 3 & 2 \\ 5 & 4 \end{pmatrix}$, then $A =$

Select one:

- a. $\begin{pmatrix} 8 & -4 \\ -10 & 6 \end{pmatrix}$
- b. $\begin{pmatrix} 1 & \frac{-1}{2} \\ \frac{-5}{4} & \frac{3}{4} \end{pmatrix}$
- c. $\begin{pmatrix} 4 & -2 \\ -5 & 3 \end{pmatrix}$
- d. $\begin{pmatrix} 2 & -1 \\ \frac{-5}{2} & \frac{3}{2} \end{pmatrix}$

The correct answer is: $\begin{pmatrix} 1 & \frac{-1}{2} \\ \frac{-5}{4} & \frac{3}{4} \end{pmatrix}$

Question **19**

Correct

Mark 1 out of 1

If A is a nonsingular 3×3-matrix, then the reduced row echelon form of A has no row of zeros.

Select one:

- a. True
- b. False

The correct answer is: True

Question **20**

Correct

Mark 1 out of 1

If E is an elementary matrix of type III, then E^T is

Select one:

- a. not an elementary matrix
- b. an elementary matrix of type III
- c. an elementary matrix of type I
- d. an elementary matrix of type II

The correct answer is: an elementary matrix of type III

Question **21**

Correct

Mark 1 out of 1

Let $A = \begin{pmatrix} 1 & 1 & 0 \\ 1 & a & 1 \\ 1 & 1 & 2 \end{pmatrix}$. the value(s) of a that make A nonsingular

Select one:

- a. $a = 1$
- b. $a = \frac{1}{2}$
- c. $a \neq \frac{1}{2}$
- d. $a \neq 1$

The correct answer is: $a \neq 1$

Question **22**

Correct

Mark 1 out of 1

Let $A = \begin{pmatrix} 1 & -1 & 1 \\ 3 & -2 & 2 \\ -2 & 3 & 3 \end{pmatrix}$, then det$(A) =$

Select one:

- a. 9
- b. 6 ✔
- c. 7
- d. 0

The correct answer is: 6

Question **23**

Correct

Mark 1 out of 1

If A is a 4×3-matrix, $b \in \mathbb{R}^4$, and the system $Ax = b$ is consistent, then $Ax = b$ has a unique solution.

Select one:

- a. False ✔
- b. True

The correct answer is: False

Question **24**

Correct

Mark 1 out of 1

The adjoint of the matrix $\begin{pmatrix} -5 & -2 \\ -3 & -1 \end{pmatrix}$ is

Select one:

- a. $\begin{pmatrix} -5 & 3 \\ 2 & -1 \end{pmatrix}$
- b. $\begin{pmatrix} 5 & -3 \\ -2 & 1 \end{pmatrix}$
- c. $\begin{pmatrix} -1 & 2 \\ 3 & -5 \end{pmatrix}$ ✔
- d. $\begin{pmatrix} -1 & -2 \\ -3 & -5 \end{pmatrix}$

The correct answer is: $\begin{pmatrix} -1 & 2 \\ 3 & -5 \end{pmatrix}$

Question **25**

Incorrect

Mark 0 out of 1

The vectors $\{x+1, x^2+2x+1, x^2+x+1\}$ form a spanning set for P_3.

Select one:

- a. False ✖
- b. True

The correct answer is: True

Question **26**

Correct

Mark 1 out of 1

Let $S = \{\begin{pmatrix} x \\ y \end{pmatrix} \in \mathbb{R}^2 : x = y + 1\}$, then S is a subspace of $\mathbb{R}^2$.

Select one:

- a. True
- b. False ✔

The correct answer is: False

Question **27**

Correct

Mark 1 out of 1

If A is an $n \times n$-symmetric matrix, then A^2 is symmetric.

Select one:

- a. True ✔
- b. False

The correct answer is: True

Question **28**

Correct

Mark 1 out of 1

If $(A|b) = \left(\begin{array}{ccc|c} 1 & -1 & -1 & 2 \\ -2 & 3 & 1 & -1 \\ 1 & 1 & \alpha & \beta \end{array}\right)$, then the system has only one solution if and only if

Select one:

- a. $\alpha = -3$ and $\beta \neq 8$
- b. $\alpha \neq -3$ and β any number ✔
- c. $\alpha \neq -3$ and $\beta \neq 8$
- d. $\alpha = -3$ and $\beta = 8$

The correct answer is: $\alpha \neq -3$ and β any number

Question **29**

Correct

Mark 1 out of 1

Let $(1,2,1)^T$ and $(2,1,1)^T$ be the first two columns of a 3×3 matrix A and $(1,1,1)^T$ be a solution of the system $Ax = (7,2,3)^T$. Then the third column of the matrix A is

Select one:

- a. $(-1,-2,-2)^T$.
- b. $(1,2,2)^T$.
- c. $(1,1,0)^T$.
- d. $(4,-1,1)^T$.

The correct answer is: $(4,-1,1)^T$.

Question **30**

Correct

Mark 1 out of 1

If A is a nonsingular $n \times n$ matrix, $b \in \mathbb{R}^n$, then

Select one:

- a. The system $Ax = b$ has infinitely many solutions
- b. The system $Ax = b$ has a unique solution
- c. The system $Ax = b$ is inconsistent
- d. The system $Ax = b$ has only two solutions

The correct answer is: The system $Ax = b$ has a unique solution

Question **31**

Correct

Mark 1 out of 1

The product of two elementary matrices is elementary

Select one:

- a. False
- b. True

The correct answer is: False

Question **32**

Correct

Mark 1 out of 1

Any two $n \times n$-nonsingular matrices are row equivalent.

Select one:

- a. False
- b. True ✔

The correct answer is: True

Jump to...

Announcements ►

Dashboard / My courses / INTRODUCTION TO LINEAR ALGEBRA-Lecture-1202 - MATH234-Meta / General / Midterm Exam

Started on	Sunday, 9 May 2021, 11:34 AM
State	Finished
Completed on	Sunday, 9 May 2021, 12:48 PM
Time taken	1 hour 13 mins
Grade	**28** out of 32 (**88**%)

Question **1**

Correct

Mark 1 out of 1

If A is a symmetric $n \times n$-matrix and P any $n \times n$-matrix, then $P^T AP$ is

Select one:

- a. singular
- b. not defined
- c. not symmetric
- d. symmetric

The correct answer is: symmetric

Question **2**

Incorrect

Mark 0 out of 1

$(1,1,3)^T$ is a linear combination of the vectors $(1,2,3)^T, (1,4,1)^T, (2,3,1)^T$

Select one:

- a. True
- b. False

The correct answer is: True

Question **3**

Incorrect

Mark 0 out of 1

One of the follwoing sets is a subspace of P_4

Select one:

a. $S = \{f(x) \in P_4 : f(1) = 0\}$

b. $S = \{f(x) \in P_4 : f(0) = 0, \text{and } f'(0) = 2\}$

c. $S = \{f(x) \in P_4 : f(0) = 1\}$

d. $S = \{f(x) \in P_4 : f(1) = 1\}$

The correct answer is: $S = \{f(x) \in P_4 : f(1) = 0\}$

Question **4**

Correct

Mark 1 out of 1

Let $U = \left\{ \begin{pmatrix} x \\ y \end{pmatrix} : y = x + 1 \right\}$. Then U is a subspace of $\mathbb{R}^2$

Select one:

a. False

b. True

The correct answer is: False

Question **5**

Correct

Mark 1 out of 1

If A is a 3×3-matrix and the system $Ax = \begin{pmatrix} 5 \\ 1 \\ 3 \end{pmatrix}$ has a unique solution, then the system $Ax = \begin{pmatrix} 0 \\ 0 \\ 0 \end{pmatrix}$

Select one:

a. is inconsistent

b. has infinitely many solutions

c. has only the zero solution.

The correct answer is: has only the zero solution.

Question **6**

Correct

Mark 1 out of 1

If A is an $n \times n$-symmetric matrix, then A^2 is symmetric.

Select one:

- a. True ✔
- b. False

The correct answer is: True

Question **7**

Incorrect

Mark 0 out of 1

If S is a subset of a vector space V, and $0 \in S$, then S is a subspace of V.

Select one:

- a. True ✖
- b. False

The correct answer is: False

Question **8**

Correct

Mark 1 out of 1

If A and B are singular matrices, then $A + B$ is also singular.

Select one:

- a. True
- b. False ✔

The correct answer is: False

Question 9

Correct

Mark 1 out of 1

The adjoint of the matrix $\begin{pmatrix} -2 & -1 \\ 1 & -4 \end{pmatrix}$ is

Select one:

- a. $\begin{pmatrix} -1 & 2 \\ 4 & 1 \end{pmatrix}$
- b. $\begin{pmatrix} -4 & 1 \\ -1 & -2 \end{pmatrix}$ ✔
- c. $\begin{pmatrix} 4 & 1 \\ -1 & 2 \end{pmatrix}$
- d. $\begin{pmatrix} 2 & 1 \\ -1 & 4 \end{pmatrix}$

The correct answer is: $\begin{pmatrix} -4 & 1 \\ -1 & -2 \end{pmatrix}$

Question 10

Correct

Mark 1 out of 1

Let $(1,2,0)^T$ and $(2,1,1)^T$ be the first two columns of a 3×3 matrix A and $(1,1,1)^T$ be a solution of the system $Ax = (4,3,5)^T$. Then the third column of the matrix A is

Select one:

- a. $(1,3,-4)^T$.
- b. $(1,-3,4)^T$.
- c. $(4,-1,1)^T$.
- d. $(1,0,4)^T$. ✔

The correct answer is: $(1,0,4)^T$.

Question **11**

Correct

Mark 1 out of 1

If A is a 3×3 matrix such that $det(A) = 2$, then $\det(3A) = 6$

Select one:

- a. True
- b. False

The correct answer is: False

Question **12**

Correct

Mark 1 out of 1

If $A = \begin{pmatrix} 2 & 1 & -1 \\ -2 & 0 & 2 \\ 4 & 2 & 3 \end{pmatrix}$ then the lower triangular matrix L in the LU-facrorization of A is given by

Select one:

- a. $L = \begin{pmatrix} 1 & 0 & 0 \\ -1 & 1 & 0 \\ 2 & 0 & 1 \end{pmatrix}$
- b. $L = \begin{pmatrix} 1 & 0 & 0 \\ 1 & 1 & 0 \\ -2 & 0 & 1 \end{pmatrix}$
- c. $L = \begin{pmatrix} 1 & 0 & 0 \\ 1 & 1 & 0 \\ 2 & 0 & 1 \end{pmatrix}$
- d. $L = \begin{pmatrix} 1 & 0 & 0 \\ -1 & 1 & 0 \\ -2 & 0 & 1 \end{pmatrix}$

The correct answer is: $L = \begin{pmatrix} 1 & 0 & 0 \\ -1 & 1 & 0 \\ 2 & 0 & 1 \end{pmatrix}$

Question **13**

Correct

Mark 1 out of 1

In the linear system $Ax = b$, if $b = a_1 = a_2 + 3a_4$ then the system $Ax = b$ has infinite solutions.

Select one:

- a. True
- b. False

The correct answer is: True

Question **14**

Correct

Mark 1 out of 1

Any two $n \times n$-nonsingular matrices are row equivalent.

Select one:

- a. True
- b. False

The correct answer is: True

Question **15**

Correct

Mark 1 out of 1

If A, B are $n \times n$-skew-symmetric matrices(A is skew symmetric if $A^T = -A$), then $AB + BA$ is symmetric

Select one:

- a. False
- b. True

The correct answer is: True

Question **16**

Correct

Mark 1 out of 1

Let $A = \begin{pmatrix} 1 & 2 & 3 & 0 \\ 1 & 1 & 2 & 1 \\ 2 & 3 & 5 & 1 \end{pmatrix}$ and $b = \begin{pmatrix} 2 \\ 1 \\ 4 \end{pmatrix}$. The system $Ax = b$

Select one:

- a. has a unique solution
- b. has infinitely many solutions
- c. has exactly three solutions.
- d. is inconsistent

The correct answer is: is inconsistent

Question **17**

Correct

Mark 1 out of 1

If u, v, w are nonzero vectors in $\mathbb{R}^2$, then $w \in \mathbf{span}(u, v)$

Select one:

- a. False
- b. True

The correct answer is: False

Question **18**

Correct

Mark 1 out of 1

Let $A = \begin{pmatrix} 1 & -1 & 1 \\ 3 & -2 & 2 \\ -2 & 6 & 4 \end{pmatrix}$, then $\det(A) =$

Select one:

- a. 9
- b. 10
- c. 0
- d. 5

The correct answer is: 10

Question **19**

Incorrect

Mark 0 out of 1

If the row echelon form of $(A|b)$ is $\begin{pmatrix} 1 & 0 & -2 & -1 & | & -2 \\ 0 & 1 & 1 & -1 & | & -1 \\ 0 & 0 & 1 & 1 & | & 1 \end{pmatrix}$ then the general form of the solutions is given by

Select one:

- a. $x = \begin{pmatrix} -\alpha \\ -2+2\alpha \\ 1-\alpha \\ \alpha \end{pmatrix}$
- b. $x = \begin{pmatrix} -2-\alpha \\ -1+2\alpha \\ -\alpha \\ \alpha \end{pmatrix}$ ✖
- c. $x = \begin{pmatrix} -2-\alpha \\ 1-\alpha \\ \alpha \\ 1 \end{pmatrix}$
- d. $x = \begin{pmatrix} \alpha \\ 2-\alpha \\ \alpha \\ \alpha \end{pmatrix}$

The correct answer is: $x = \begin{pmatrix} -\alpha \\ -2+2\alpha \\ 1-\alpha \\ \alpha \end{pmatrix}$

Question **20**

Correct

Mark 1 out of 1

If E is an elementary matrix then one of the following statements is false

Select one:

- a. E^{-1} is an elementary matrix.
- b. E is nonsingular.
- c. E is diagonal matrix. ✔
- d. E^T is an elementary matrix.

The correct answer is: E is diagonal matrix.

Question **21**

Correct

Mark 1 out of 1

If A is a 3×3 matrix with $\det(A) = 2$. Then $\det(adj(A)) =$

Select one:

- a. $-2.$
- b. $-8.$
- c. $8.$
- d. $4.$ ✔

The correct answer is: $4.$

Question **22**

Correct

Mark 1 out of 1

If x_0 is a solution for the nonhomogeneous system $Ax = b$ and x_1 is a solution of the homogeneous system $Ax = 0$. Then $x_1 + x_0$ is a solution for

Select one:

- a. the system $Ax = b$ ✔
- b. the system $Ax = Ab$
- c. the system $Ax = 0$
- d. the system $Ax = 2b$

The correct answer is: the system $Ax = b$

Question **23**

Correct

Mark 1 out of 1

If $(A|b) = \left(\begin{array}{ccc|c} 1 & -1 & -1 & 2 \\ -2 & 3 & 1 & -1 \\ 1 & 1 & \alpha & \beta \end{array}\right)$, then the system is inconsistent if and only if

Select one:

- a. $\alpha \neq -3$ and β any number
- b. $\alpha = -3$ and $\beta \neq 8$ ✔
- c. $\alpha \neq -3$ and $\beta \neq 8$
- d. $\alpha = -3$ and $\beta = 8$

The correct answer is: $\alpha = -3$ and $\beta \neq 8$

Question **24**

Correct

Mark 1 out of 1

The vectors $\{(1,-1,1)^T, (1,-1,2)^T, (1,-1,1)^T\}$ form a spanning set for $\mathbb{R}^3$.

Select one:

- a. False ✔
- b. True

The correct answer is: False

Question **25**

Correct

Mark 1 out of 1

Let $S = \{\begin{pmatrix} x \\ y \end{pmatrix} \in \mathbb{R}^2 : x = \frac{1}{y}\}$, then S is a subspace of $\mathbb{R}^2$.

Select one:

- a. False ✔
- b. True

The correct answer is: False

Question **26**

Correct

Mark 1 out of 1

Let V be a vector space, $\{v_1, v_2, \ldots, v_n\}$ a spanning set for V, and $v \in V$, then the vectors $\{v_1, v_2, \ldots, v_n, v\}$ form a spanning set for V.

Select one:

- a. True
- b. False

The correct answer is: True

Question **27**

Correct

Mark 1 out of 1

If $AB = AC$, and $|A| \neq 0$, then

Select one:

- a. $A = 0$
- b. $A = C$
- c. $B = C$.
- d. $B \neq C$

The correct answer is: $B = C$.

Question **28**

Correct

Mark 1 out of 1

If $(A|b) = \begin{pmatrix} 1 & 1 & 2 & | & 4 \\ 2 & -1 & 2 & | & 6 \\ 0 & 3 & 2 & | & 1 \end{pmatrix}$ is the augmented matrix of the system $Ax = b$ then the system has no solution

Select one:

- a. True
- b. False

The correct answer is: True

Question **29**

Correct

Mark 1 out of 1

Let A be a 3×4 matrix which has a row of zeros, and let B be a 4×4 matrix , then AB has a row of zeros.

Select one:

- a. False
- b. True

The correct answer is: True

Question **30**

Correct

Mark 1 out of 1

If A is a 3×5 matrix, then the system $Ax = 0$

Select one:

- a. is inconsistent
- b. has only the zero solution
- c. has infinitely many solutions
- d. has no solution.

The correct answer is: has infinitely many solutions

Question **31**

Correct

Mark 1 out of 1

If $AB = 0$, where A and B are $n \times n$ nonzero matrices. Then

Select one:

- a. both A, B are singular.
- b. either A or B is nonsingular
- c. either $A = 0$ or $B = 0$
- d. both A, B are nonsingular.

The correct answer is: both A, B are singular.

Question **32**

Correct

Mark 1 out of 1

The vectors $\{x+1, x^2+x+3, x^2+x+2\}$ form a spanning set for P_3.

Select one:

- a. False
- b. True

The correct answer is: True

Jump to...

Announcements ►

Started on	Friday, 25 June 2021, 1:30 PM
State	Finished
Completed on	Friday, 25 June 2021, 1:30 PM
Time taken	10 secs
Marks	0.00/13.00
Grade	**0.00** out of 10.00 (**0**%)

Question **1**

Not answered

Marked out of 1.00

Let L be a linear transformation from R^5 into R^3
with $dim(Ker(L)) = 2.$ Then $Kerl(L) = \{0\}$

Select one:

- True
- False

The correct answer is 'False'.

Question **2**

Not answered

Marked out of 1.00

If $L : \mathbb{R}^2 \to \mathbb{R}^2$ is the
linear transformation defined by $L((x, y)^t) = (x - y, x + y)^t$, then $(2, 3)^t$
is in ImL.

Select one:

- True
- False

The correct answer is 'True'.

Question **3**

Not answered

Marked out of 1.00

Let

$L : \mathbb{R}^2 \to \mathbb{R}^3$ be defined by

$L((x, y)^T) = ((x - y, xy, 2x)^T)$, then L is a linear transformation.

Select one:

- True
- False

The correct answer is 'False'.

Question **4**

Not answered

Marked out of 1.00

Suppose that $T : V \to W$ is a linear transformation whose

2×2 matrix representation A, and $rank(A) = 2$. Then T is one to one

Select one:

- True
- False

The correct answer is 'True'.

Question **5**

Not answered

Marked out of 1.00

If $L : \mathbb{R}^2 \to \mathbb{R}^2$ is the

linear transformation defined by $L((x, y)^t) = (x - y, x + y)^t$, then L is one to one

Select one:

- True
- False

The correct answer is 'True'.

Question **6**

Not answered

Marked out of 1.00

Let L be a linear transformation from R^5 into R^3 with $dim(Ker(L)) = 2.$ Then $Rang(L) = R^3$

Select one:

- True
- False

The correct answer is 'True'.

Question **7**

Not answered

Marked out of 1.00

Suppose that $T : V \to W$ is a linear transformation whose 2×2 matrix representation A, and $rank(A) = 2$. Then $KerT = \{0\}$ to one

Select one:

- True
- False

The correct answer is 'True'.

Question **8**

Not answered

Marked out of 1.00

Suppose that $T : V \to W$ is a linear transformation whose 2×2 matrix representation A, and $rank(A) = 2$. Then T is onto

Select one:

- True
- False

The correct answer is 'True'.

Question **9**

Not answered

Marked out of 1.00

Suppose that $T : V \to W$ is a linear transformation whose 2×2 matrix representation A, and $rank(A) = 2$. Then Range$T = W$

Select one:

- True
- False

The correct answer is 'True'.

Question **10**

Not answered

Marked out of 1.00

Let
$L : \mathbb{R}^2 \to \mathbb{R}^3$ be defined by
$L((x, y)^T) = ((x - y, 1, 2x)^T)$, then L is a linear transformation.

Select one:

- True
- False

The correct answer is 'False'.

Question **11**

Not answered

Marked out of 1.00

Let L be a linear transformation from R^5 into R^3
with $dim(Ker(L)) = 2$. Then L is onto

Select one:

- True
- False

The correct answer is 'True'.

Question **12**

Not answered

Marked out of 1.00

Let L be a linear transformation from R^5 into R^3 with $dim(Ker(L)) = 2.$ Then $kerl(L) = R^5$

Select one:

- True
- False

The correct answer is 'False'.

Question **13**

Not answered

Marked out of 1.00

Let $L: \mathbb{R}^3 \to \mathbb{R}^3$ be the linear transformation defined as L((a,b,c))= (a,a-b,c-b), then dim$(ker(L)) = 0$

Select one:

- True
- False

The correct answer is 'True'.

◄ Practice -chapter2

Jump to...

Practice-chaptet3 ►

Started on	Monday, 7 June 2021, 9:13 PM
State	Finished
Completed on	Monday, 7 June 2021, 9:14 PM
Time taken	45 secs
Marks	13.00/21.00
Grade	**6.19** out of 10.00 (**62**%)

Question **1**

Correct

Mark 1.00 out of 1.00

If A is a 3×3 singular matrix with only one eigenvalue, then the characteristic equation of A is $x^3 = 0$

Select one:

- True ✔
- False

The correct answer is 'True'.

Question **2**

Correct

Mark 1.00 out of 1.00

If A is a 3×3 matrix such that $1, 1 - i$ are eigenvalues of A, then trace$A = 2 - i$

Select one:

- True
- False ✔

The correct answer is 'False'.

Question **3**

Correct

Mark 1.00 out of 1.00

If λ is an eigenvalue of a square matrix A with $alg(\lambda) = n$, then $gem(\lambda) = n$.

Select one:

True

False ✔

The correct answer is 'False'.

Question **4**

Incorrect

Mark 0.00 out of 1.00

Let $A = \begin{bmatrix} 1 & 0 & 0 \\ 0 & -1 & 0 \\ 2 & 3 & 7 \end{bmatrix}$, then the eigenvalues of A^{100} are $1, -1, 7$

Select one:

True ✖

False

The correct answer is 'False'.

Question **5**

Incorrect

Mark 0.00 out of 1.00

If λ is an eigenvalue of a matrix A, then the system $(A - \lambda I)x = 0$ has a nontrivial solution.

Select one:

True

False ✖

The correct answer is 'True'.

Question **6**

Incorrect

Mark 0.00 out of 1.00

If A is a 3×3 matrix such that $Ax = 0$ for a nonzero x, then the characteristic equation of A could be $x^3 + x = 0$

Select one:

- True
- False ✖

The correct answer is 'True'.

Question **7**

Correct

Mark 1.00 out of 1.00

Any singular matrix has 0 as an eigenvalue

Select one:

- True ✔
- False

The correct answer is 'True'.

Question **8**

Correct

Mark 1.00 out of 1.00

If A is a 3×3 singular matrix such that $\lambda_1 = 1 - i$ is an eigenvalue of A, then the other eigenvalues of A are $0, 1 + i$

Select one:

- True ✔
- False

The correct answer is 'True'.

Question **9**

Incorrect

Mark 0.00 out of 1.00

If an $n \times n$ matrix A is singular then A must have n linearly independent eigenvectors

Select one:

- True ✖
- False

The correct answer is 'False'.

Question **10**

Incorrect

Mark 0.00 out of 1.00

If A is a 3×3 singular matrix such that $\lambda_1 = 1 - i$ is an eigenvalue of A, then A is diagonalizable

Select one:

- True
- False ✖

The correct answer is 'True'.

Question **11**

Incorrect

Mark 0.00 out of 1.00

If A is a 3×3 singular matrix such that $\lambda_1 = 1 - i$ is an eigenvalue of A, then trace$(A) = 2$

Select one:

- True
- False ✖

The correct answer is 'True'.

Question **12**

Correct

Mark 1.00 out of 1.00

If A, B are similar matrices , then $det(A) = det(B)$

Select one:

- True ✔
- False

The correct answer is 'True'.

Question **13**

Correct

Mark 1.00 out of 1.00

If A is a 3×3 singular matrix such that $\lambda_1 = 1 - i$ is an eigenvalue of A, then A is defective

Select one:

- True
- False ✔

The correct answer is 'False'.

Question **14**

Correct

Mark 1.00 out of 1.00

If an $n \times n$ matrix A is nonsingular then A must have n linearly independent eigenvectors

Select one:

- True
- False ✔

The correct answer is 'False'.

Question **15**

Correct

Mark 1.00 out of 1.00

If A is a 3×3 singular matrix such that $\lambda_1 = i$ is an eigenvalue of A, then the characteristic polynomial of A is $x^3 + x$

Select one:

- True ✔
- False

The correct answer is 'True'.

Question **16**

Correct

Mark 1.00 out of 1.00

If A is a 3×3 matrix such that $Ax = 0$ for a nonzero x, then A is singular

Select one:

- True ✔
- False

The correct answer is 'True'.

Question **17**

Correct

Mark 1.00 out of 1.00

If A is a 3×3 matrix such that $1, 1-i$ are eigenvalues of A, then $|A| = 1-i$

Select one:

- True
- False ✔

The correct answer is 'False'.

Question **18**

Incorrect

Mark 0.00 out of 1.00

If λ is a simple eigenvalue
(i.e. of algebraic multiplicity 1) of a square matrix A, then λ
can have more than one linearly independent eigenvectors.

Select one:

- (●) True ✖
- ( ) False

The correct answer is 'False'.

Question **19**

Correct

Mark 1.00 out of 1.00

Any matrix has 0 as an eigenvalue is singular

Select one:

- (●) True ✔
- ( ) False

The correct answer is 'True'.

Question **20**

Correct

Mark 1.00 out of 1.00

Similar matrices have the same eigenvectors.

Select one:

- ( ) True
- (●) False ✔

The correct answer is 'False'.

Question **21**

Incorrect

Mark 0.00 out of 1.00

If A is a 3×3 singular matrix such that $\lambda_1=2,\lambda_2=-2$ are eigenvalues of A, then trace$(A)=0$

Select one:

- True
- False ✖

The correct answer is 'True'.

◄ Practice-chaptet3

Jump to...

recording7 ►

Started on	Friday, 25 June 2021, 1:27 PM
State	Finished
Completed on	Friday, 25 June 2021, 1:28 PM
Time taken	1 min 4 secs
Marks	4.00/21.00
Grade	**2.10** out of 11.00 (**19**%)

Question **1**

Incorrect

Mark 0.00 out of 1.00

Let A be a square and nonsingular $n \times n$ matrix.

If $ | adjA | = | A | $ then A is 2×2.

Select one:

- True ✖
- False

The correct answer is 'False'.

Question **2**

Incorrect

Mark 0.00 out of 1.00

Let E be an elementary matrix of type III, then $|E| = 1$.

Select one:

- True
- False ✖

The correct answer is 'True'.

Question **3**

Correct

Mark 1.00 out of 1.00

If $AB = AC$, and $|A| \neq 0$, then $B = C$.

Select one:

- True ✔
- False

The correct answer is 'True'.

Question **4**

Correct

Mark 1.00 out of 1.00

Cramer's rule is very practical in solving linear systems.

Select one:

- True
- False ✔

The correct answer is 'False'.

Question **5**

Correct

Mark 1.00 out of 1.00

If $det(A) = det(B)$, then $A = B$.

Select one:

- True
- False ✔

The correct answer is 'False'.

Question **6**

Incorrect

Mark 0.00 out of 1.00

Let E be an elementary matrix of type I, then $|E| = 1$.

Select one:

- True ✖
- False

The correct answer is 'False'.

Question **7**

Not answered

Marked out of 1.00

If A is row equivalent to I then $\det(A) = 1$.

Select one:

- True
- False

The correct answer is 'False'.

Question **8**

Correct

Mark 1.00 out of 1.00

Let A, B be $n \times n$ equivalent matrices. Then $|A| = |B|$.

Select one:

- True
- False ✔

The correct answer is 'False'.

Question **9**

Not answered

Marked out of 2.00

An $n \times n$ matrix A is invertible if

Select one:

- a. $|A| \neq 0$
- b. $|A| = 0$
- c. all
- d. $Ax = 0$ has a nonzero solution

The correct answer is: $|A| \neq 0$

Question **10**

Not answered

Marked out of 2.00

Let A be a 3×3 matrix such that $Ax = b$ has infinite solutions. Then

Select one:

a. A is nonsingular

b. $|A| \neq 0$

c. $|A| = 0$

d. A is row equivalent to the identity

The correct answer is: $|A| = 0$

Question **11**

Not answered

Marked out of 1.00

If A and B are invertible, then $det(A) = det(B)$.

Select one:

True

False

The correct answer is 'False'.

Question **12**

Not answered

Marked out of 1.00

Let A be 3×3 matrix such that $|A| = 5$. Then $Ax = 0$ has only the zero solution.

Select one:

- True
- False

The correct answer is 'True'.

Question **13**

Not answered

Marked out of 1.00

If A is singular, then $|adj(A)| \neq 0$.

Select one:

- True
- False

The correct answer is 'False'.

Question **14**

Not answered

Marked out of 1.00

The adjoint method (cofactor method) is more practical than row operations to find the inverse of a square matrix.

Select one:

- True
- False

The correct answer is 'False'.

Question **15**

Not answered

Marked out of 2.00

If A an 3×3 matrix such that $Ax = 0$ for a nonzero x, then

Select one:

a. $|A| = 0$

b. A is nonsingular

c. A is row equivalent to the identity

d. $|A| \neq 0$

The correct answer is: $|A| = 0$

Question **16**

Not answered

Marked out of 1.00

Let A be $n \times n$. Then $|adj(A)| = |A|$.

Select one:

True

False

The correct answer is 'False'.

Do

Question **17**

Not answered

Marked out of 2.00

Let A, B be 2×2 matrix $|A| = |2B| = 4$. Then $|(2AB)^{-1}| =$

Select one:

- a. 4
- b. 16
- c. $\frac{1}{16}$
- d. 8

The correct answer is: $\frac{1}{16}$

◄ Short exam 1 -Sunday 11-4-2021

Jump to...

Practice ch4 ►

Started on	Monday, 7 June 2021, 9:10 PM
State	Finished
Completed on	Monday, 7 June 2021, 9:11 PM
Time taken	57 secs
Marks	4.00/57.00
Grade	**0.70** out of 10.00 (**7**%)

Question **1**

Incorrect

Mark 0.00 out of 1.00

The LU decomposition of the matrix $\begin{bmatrix} 2 & 4 & 2 \\ 1 & 5 & 2 \\ 4 & -1 & 9 \end{bmatrix}$ is

Select one:

a. $L = \begin{bmatrix} 1 & 0 & 0 \\ -\frac{1}{2} & 1 & 0 \\ -2 & -3 & 1 \end{bmatrix}, U = \begin{bmatrix} 2 & 4 & 2 \\ 0 & 3 & 1 \\ 0 & 0 & 8 \end{bmatrix}$

b. $L = \begin{bmatrix} 1 & 0 & 0 \\ \frac{1}{2} & 1 & 0 \\ 2 & -3 & 1 \end{bmatrix}, U = \begin{bmatrix} 2 & 4 & 2 \\ 0 & 3 & 1 \\ 0 & 0 & 8 \end{bmatrix}$

c. $L = \begin{bmatrix} 1 & 0 & 0 \\ -\frac{1}{2} & 1 & 0 \\ 2 & 3 & 1 \end{bmatrix}, U = \begin{bmatrix} 2 & 4 & 2 \\ 0 & 3 & 1 \\ 0 & 0 & 8 \end{bmatrix}$

d. None ✖

The correct answer is: $L = \begin{bmatrix} 1 & 0 & 0 \\ \frac{1}{2} & 1 & 0 \\ 2 & -3 & 1 \end{bmatrix}, U = \begin{bmatrix} 2 & 4 & 2 \\ 0 & 3 & 1 \\ 0 & 0 & 8 \end{bmatrix}$

Question **2**

Correct

Mark 1.00 out of 1.00

If z_1 is a solution of the non-homogeneous system $Ax=b$ and z_0 is a solution of the homogeneous system $Ax=0$. Then z_0+z_1 is a solution of $Ax=b$.

Select one:

- True ✔
- False

The correct answer is 'True'.

Question **3**

Incorrect

Mark 0.00 out of 1.00

If the coefficient matrix of the system ***Ax = 0*** is nonsingular then the system has unique solution

Select one:

- True
- False ✖

The correct answer is 'True'.

Question **4**

Correct

Mark 1.00 out of 1.00

In the linear system ***Ax=b***, if $b=a_1-a_2+3a_4=a_1$ then the system has infinite solutions.

Select one:

- True ✔
- False

The correct answer is 'True'.

Question **5**

Correct

Mark 1.00 out of 1.00

If the system ***Ax* = *b*** is inconsistent then ***b*** is not a linear combinations of the columns of ***A***.

Select one:

- True ✔
- False

The correct answer is 'True'.

Question **6**

Correct

Mark 1.00 out of 1.00

Let A be 3×3 be the coefficient matrix of $Ax=0$ such that $a_1=3a_3$ and $a_1-a_2+3a_3=0$. Then the solutions of $Ax=0$ are of the form $a(1,0,-3)^t+b(1,-1,3)^t$, where $a,b\in R$.

Select one:

- True ✔
- False

The correct answer is 'True'.

Question **7**

Incorrect

Mark 0.00 out of 1.00

If If A,B,AB are $n\times n$ symmetric matrices. Then $AB=BA$.

Select one:

- True
- False ✖

The correct answer is 'True'.

Question **8**

Not answered

Marked out of 1.00

If A is a 4×3 matrix such that $Ax=0$ has only the trivial solution, and let $b=\begin{pmatrix}0\\3\\2\\1\end{pmatrix}$, then

Select one:

- a. It is possible that $AX=b$ has infinitely many solutions
- b. The system $AX=b$ has exactly one solution
- c. The system $AX=b$ has at most one solution.
- d. None of the above

The correct answer is: The system $AX=b$ has at most one solution.

Question **9**

Not answered

Marked out of 1.00

If ***A, B*** are square ***n*** × ***n*** matrices and ***AB*** is non-singular then ***A*** and ***B*** are non-singular.

Select one:

- True
- False

The correct answer is 'True'.

Question **10**

Not answered

Marked out of 1.00

Let A be 3×3 be the coefficient matrix of $Ax=0$ such that $a_1=3a_3$. Then A is singular.

Select one:

- True
- False

The correct answer is 'True'.

Question **11**

Not answered

Marked out of 1.00

If A, B are square $n \times n$ matrices, then $(A+B)(A-B) = A^2 - B^2$.

Select one:

- True
- False

The correct answer is 'False'.

Question **12**

Not answered

Marked out of 1.00

In the linear system ***Ax = b***, if ***b*** is the first row of ***A*** then the system has infinitely many solutions.

Select one:

- True
- False

The correct answer is 'False'.

Question **13**

Not answered

Marked out of 1.00

Let A be $n \times n$. Then A is nonsingular iff A^t is nonsingular.

Select one:

- True
- False

The correct answer is 'True'.

Question **14**

Not answered

Marked out of 1.00

Let A be 3×3 be the coefficient matrix of $Ax=0$ such that $a_1=3a_3$. Then $Ax=0$ has a infinite solutions.

Select one:

- True
- False

The correct answer is 'True'.

Question **15**

Not answered

Marked out of 1.00

If $AB=AC$, A is non-singular, then $B=C$.

Select one:

- True
- False

The correct answer is 'True'.

Question **16**

Not answered

Marked out of 1.00

If B is a 3×3 matrix such that $B^2=B$. One of the following is always true

Select one:

- a. B is nonsingular.
- b. $B=I$.
- c. $B=B^{-1}$
- d. $B^5=B$.

The correct answer is: $B^5=B$.

Question **17**
Not answered
Marked out of 1.00

If z_0 is a solution of the non-homogeneous system $Ax = b$
and z_1 is a solution of the homogeneous system $Ax = 0$. Then $z_0 + z_1$ is a solution of $Ax = b$.

Select one:
- True
- False

The correct answer is 'True'.

Question **18**
Not answered
Marked out of 1.00

If A is symmetric and skew symmetric then $A = 0$.
(A is skew symmetric if $A = -A^T$).

Select one:
- True
- False

The correct answer is 'True'.

Question **19**
Not answered
Marked out of 1.00

If ***A*,*B*** are square **n × n** matrices such that ***AB*=*0***, then **A** and **B** are singular.

Select one:
- True
- False

The correct answer is 'False'.

Question **20**

Not answered

Marked out of 1.00

Let A be $n \times n$. Then A always has an LU factorization.

Select one:

- True
- False

The correct answer is 'False'.

Question **21**

Not answered

Marked out of 1.00

Let A be 3×3 be the coefficient matrix of the linear system $(A|b)$ such that A has two identical rows. Then $Ax = 0$ has infinite solutions.

Select one:

- True
- False

The correct answer is 'True'.

Question **22**

Not answered

Not graded

What is the last two digits of your student number?

Answer:

The correct answer is: 0

Question **23**

Not answered

Marked out of 1.00

If ***A, B*** are **n × n** symmetric matrices then ***AB*** is symmetric.

Select one:

- True
- False

The correct answer is 'False'.

Question **24**

Not answered

Marked out of 1.00

If ***A, B*** are square ***n × n*** matrices and ***A,B*** are non-singular then ***AB*** is non-singular.

Select one:

- True
- False

The correct answer is 'True'.

Question **25**

Not answered

Marked out of 1.00

The vector $(0,0,0)^T$ is a linear combination of

the vectors $(1,2,3)^T,(1,4,1)^T,(2,3,1)^T$

Select one:

- True
- False

The correct answer is 'True'.

Question **26**

Not answered

Marked out of 1.00

Let A be $n \times n$. If A is nonsingular, then A^t is nonsingular.

Select one:

- True
- False

The correct answer is 'True'.

Question **27**

Not answered

Marked out of 1.00

If A is a 4×3 matrix such that $Ax = 0$ has only the zero solution,

and $b = \begin{pmatrix} 1 \\ 3 \\ 2 \\ 0 \end{pmatrix}$, then the system $Ax = b$

Select one:

- a. has exactly one solution
- b. is either inconsistent or has an infinite number of solutions
- c. is inconsistent
- d. is either inconsistent or has exactly one solution.

The correct answer is: is either inconsistent or has exactly one solution.

Question **28**

Not answered

Marked out of 1.00

If the row echelon form of the matrix ***A*** involves a free variable, then the linear system ***Ax = b*** has infinitely many solutions.

Select one:

- True
- False

The correct answer is 'False'.

Question **29**

Not answered

Marked out of 1.00

Let $A=\begin{pmatrix}1&2&3&0\\0&-1&1&2\\2&3&7&2\end{pmatrix}$ be the coefficient matrix of the system $Ax=b$. If $b\in R^3$ then the system has infinitely many solutions.

Select one:

- True
- False

The correct answer is 'False'.

Question **30**

Not answered

Marked out of 1.00

If $A=\begin{bmatrix}1&2&3&0\\0&-1&1&0\\2&3&7&1\end{bmatrix}$ is the coefficient matrix of the linear system $Ax=b,$ then for any $b\in R^3$

Select one:

- a. the system is either inconsistent or it has infinite solutions.
- b. The system has infinite solutions
- c. The system is inconsistent
- d. The system is consistent

The correct answer is: The system has infinite solutions

Question **31**

Not answered

Marked out of 1.00

If $AB=AC$, $A\neq 0$, then $B=C$.

Select one:

- True
- False

The correct answer is 'False'.

Question **32**

Not answered

Marked out of 1.00

If $AB = 0$, where A and B are $n \times n$ matrices. Then

Select one:

- a. both A, B are nonsingular.
- b. both A, B are singular.
- c. either $A = 0$ or $B = 0$
- d. either A or B is singular.

The correct answer is: either A or B is singular.

Question **33**

Not answered

Marked out of 1.00

If $A^2 = I$ then

Select one:

- a. $A - I$ and $A + I$ are nonsingular.
- b. $A - I$ and $A + I$ both cannot be nonsingular.
- c. $A - I$ and $A + I$ are singular.
- d. none

The correct answer is: $A - I$ and $A + I$ both cannot be nonsingular.

Question **34**

Not answered

Marked out of 1.00

Let A be a 4×4 matrix. If the homogeneous system $Ax = 0$ has only the trivial solution then

Select one:

- a. A is nonsingular.
- b. A is row equivalent to I.
- c. RREF of A is I.
- d. all of the above.

The correct answer is: all of the above.

Question **35**

Not answered

Marked out of 1.00

Assume that the last row in the row echelon form of a 4×4 linear system is $\left[\begin{array}{cccc|c} 0 & 0 & 0 & a-3 & b-4 \end{array}\right]$. The system has exactly one solution if

Select one:

- a. $b \neq 4$.
- b. $a \neq 3$.
- c. $a \neq 3$ and $b \neq 4$.
- d. $a = 3$, $b = 4$.

The correct answer is: $a \neq 3$.

Question **36**

Not answered

Marked out of 1.00

Let A be $n \times n$. If A has an $LU-$factorization then A is nonsingular iff L is nonsingular.

Select one:

- True
- False

The correct answer is 'False'.

Question **37**

Not answered

Marked out of 1.00

A homogeneous system is always consistent.

Select one:

- True
- False

The correct answer is 'True'.

Question **38**

Not answered

Marked out of 1.00

Let A be 3×3 be the coefficient matrix of the linear homogeous system $(A|b)$ such that A has two identical rows. Then $Ax = 0$ has infinite solutions.

Select one:

- True
- False

The correct answer is 'True'.

Question **39**

Not answered

Marked out of 1.00

If z_0, z_1 area solutions of the non-homogeneous system $Ax = b$. Then $z_0 + z_1$ is a solution of $Ax = b$

Select one:

- True
- False

The correct answer is 'False'.

Question **40**

Not answered

Marked out of 1.00

If A, B, AB are $n \times n$ symmetric matrices. Then $AB = BA$.

Select one:

- True
- False

The correct answer is 'True'.

Question **41**

Not answered

Marked out of 1.00

Let A, B be $n \times n$ be row equivalent matrices. Then A is nonsingular *iff* B is nonsingular.

Select one:

- True
- False

The correct answer is 'True'.

Question **42**

Not answered

Marked out of 1.00

If the system ***Ax* = *b*** is inconsistent then ***b*** is not a linear combinations of the columns of ***A***.

Select one:

- True
- False

The correct answer is 'True'.

Question **43**

Not answered

Marked out of 1.00

If $(A|b)=\left(\begin{array}{ccc|c} 1 & 1 & 2 & 4 \\ 2 & -1 & 2 & 6 \\ 3 & 0 & 4 & 1 \end{array}\right)$ is the Augmented matrix of the system $Ax=b$ then the system does not have infinitely many solutions.

Select one:

- True
- False

The correct answer is 'True'.

Question **44**

Not answered

Marked out of 1.00

If A an 3×3 matrix such that $Ax=0$ for a nonzero x, then

Select one:

- a. none
- b. A is row equivalent to the identity
- c. A is nonsingular
- d. A is singular.

The correct answer is: A is singular.

Question **45**

Not answered

Marked out of 1.00

In the linear system $Ax = 0$, if $a_1 = a_2$ then the system has a unique solution.

Select one:

- True
- False

The correct answer is 'False'.

Question **46**

Not answered

Marked out of 1.00

A square matrix ***A*** is nonsingular *iff* its *REF* is the identity matrix.

Select one:

- True
- False

The correct answer is 'False'.

Question **47**

Not answered

Marked out of 1.00

Let A be 3×3 be the coefficient matrix of the linear homogeous system $(A|0)$ such that A has two identical rows. Then $Ax = 0$ has a unique solution.

Select one:

- True
- False

The correct answer is 'False'.

Question **48**

Not answered

Marked out of 1.00

If the row echelon form of the matrix **A** involves a free variable, then the linear system $(A|b)$ has infinitely many solutions.

Select one:

- True
- False

The correct answer is 'False'.

Question **49**

Not answered

Marked out of 1.00

Let A be nonsingular. Then

Select one:

- a. If A is symmetric then A^{-1} is symmetric
- b. If A is triangular then A^{-1} is triangular
- c. If A is diagonal then A^{-1} is diagonal
- d. All of the above.

The correct answer is: All of the above.

Question **50**

Not answered

Marked out of 1.00

If A and B are $n \times n$ matrices such that $Ax = Bx$ for some non zero $x \in R^n$. Then

Select one:

- a. $A - B$ is singular.
- b. none.
- c. A and B are singular.
- d. A and B are nonsingular.

The correct answer is: $A - B$ is singular.

Question **51**
Not answered
Marked out of 1.00

Let A be $n \times n$. If A has an $LU-$factorization then A is nonsingular iff U is nonsingular.

Select one:
- True
- False

The correct answer is 'True'.

Question **52**
Not answered
Marked out of 1.00

If E is an elementary matrix then one of the following statements is not true

Select one:
- a. E is nonsingular.
- b. $E+E^T$ is an elementary matrix.
- c. E^{-1} is an elementary matrix.
- d. E^T is an elementary matrix.

The correct answer is: $E+E^T$ is an elementary matrix.

Question **53**
Not answered
Marked out of 1.00

Let A be 3×3 be the coefficient matrix of $Ax=b$ such that $a_1 = 3a_3$ and $a_1 - a_2 + 3a_3 = b$. Then $Ax=b$ has infinite solutions.

Select one:
- True
- False

The correct answer is 'True'.

Question **54**

Not answered

Marked out of 1.00

If ***A = LU*** is the LU-factorization and **U** is singular then **A** is singular.

Select one:

- True
- False

The correct answer is 'True'.

Question **55**

Not answered

Marked out of 1.00

If z_0, z_1 are solutions of the non-homogeneous system $Ax = b$. Then $z_0 + z_1$ is a solution of $Ax = b$

Select one:

- True
- False

The correct answer is 'False'.

Question **56**

Not answered

Marked out of 1.00

An $n \times n$ matrix A is invertible if

Select one:

- a. there exists a matrix B such that $AB = I$.
- b. $Ax = 0$ ha a nonzero solution
- c. both (a) and (b)
- d. none of the above

The correct answer is: there exists a matrix B such that $AB = I$.

Question **57**

Not answered

Marked out of 1.00

Let A be $n \times n$. If A has an $LU-$factorization then A is row equivalent to U.

Select one:

- True
- False

The correct answer is 'True'.

Question **58**

Not answered

Marked out of 1.00

If $(A|b) = \left(\begin{array}{ccc|c} 1 & 1 & 2 & 4 \\ 2 & -1 & 2 & 6 \\ 3 & 0 & 4 & 1 \end{array}\right)$ is the Augmented matrix of a linear system, then the system does not have infinitely many solutions.

Select one:

- True
- False

The correct answer is 'True'.

◄ Quiz5

Jump to...

Short Exam3 ►

Data retention summary

Started on	Friday, 25 June 2021, 1:30 PM
State	Finished
Completed on	Friday, 25 June 2021, 1:30 PM
Time taken	14 secs
Marks	0.00/30.00
Grade	**0.00** out of 32.00 (**0**%)

Question **1**

Not answered

Marked out of 1.00

The vectors $(0, 0, 0)^T, (2, 3, 1)^T, (2, -5, 3)^T$ are linearly dependent.

Select one:

- True
- False

The correct answer is 'True'.

Question **2**

Not answered

Marked out of 2.00

In a finite dimensional vector space V,

Select one:

- a. every infinite subset of V spans V
- b. every infinite subset of V is linearly independent.
- c. every infinite subset of V is linearly dependent.
- d. every finite subset of V span V.

The correct answer is:
every infinite subset of V is linearly dependent.

Question **3**

Not answered

Marked out of 2.00

The transition matrix U from the basis $[1, 2+x]$ to $[1, x-1]$ is

Select one:

a. $U = \begin{bmatrix} 1 & 3 \\ 0 & 1 \end{bmatrix}$

b. None

c. $U = \begin{bmatrix} 1 & 1 \\ 1 & 1 \end{bmatrix}$

d. $U = \begin{bmatrix} 1 & 1 \\ -1 & 1 \end{bmatrix}$

The correct answer is:

$U = \begin{bmatrix} 1 & 3 \\ 0 & 1 \end{bmatrix}$

Question **4**

Not answered

Marked out of 2.00

The rank of

$$A = \begin{bmatrix} 1 & 2 & 3 & 0 & 1 \\ 0 & -1 & 1 & 0 & 0 \\ 2 & 3 & 7 & 0 & 2 \end{bmatrix}$$

is

Select one:

a. 4

b. 3

c. 2

d. 1

The correct answer is: 2

Question **5**

Not answered

Marked out of 1.00

If two vectors in a vector space V are linearly dependent, then one of them is a scalar multiple of the other.

Select one:

- True
- False

The correct answer is 'True'.

Question **6**

Not answered

Marked out of 1.00

Any subset of a vector space that contains the zero vector is a subspace.

Select one:

- True
- False

The correct answer is 'False'.

Question **7**

Not answered

Marked out of 1.00

A basis for the zero vector space $V = \{0\}$ is 0

Select one:

- True
- False

The correct answer is 'False'.

Question 8
Not answered
Marked out of 1.00

If n vectors span a vector space V, then a collection of $m > n$ vectors in V is linearly dependent.

Select one:
- True
- False

The correct answer is 'True'.

Question 9
Not answered
Marked out of 1.00

The coordinate vector of $2 + 2x$ with respect to the basis $[2x, 4]$ is $(1, 2)^t$

Select one:
- True
- False

The correct answer is 'False'.

Question 10
Not answered
Marked out of 1.00

Any subset of a vector space that does not contain the zero vector is not a subspace.

Select one:
- True
- False

The correct answer is 'True'.

Question **11**

Not answered

Marked out of 2.00

The dimension of the null space of

$$A = \begin{bmatrix} 1 & 2 & 3 & 0 & 1 \\ 0 & -1 & 1 & 0 & 0 \\ 2 & 3 & 7 & 0 & 2 \end{bmatrix}$$

is

Select one:

- a. 3
- b. 2
- c. 4
- d. 1

The correct answer is: 3

Question **12**

Not answered

Marked out of 2.00

A basis for the Column space of

$$A = \begin{bmatrix} 1 & 2 & 3 & 0 & 1 \\ 0 & -1 & 1 & 0 & 0 \\ 2 & 3 & 7 & 0 & 2 \end{bmatrix}$$

is

Select one:

- a. $\begin{bmatrix} 1 \\ 0 \\ 2 \end{bmatrix}, \begin{bmatrix} 3 \\ 1 \\ 7 \end{bmatrix}, \begin{bmatrix} 0 \\ 1 \\ 0 \end{bmatrix}$
- b. None
- c. $\begin{bmatrix} 3 \\ 1 \\ 7 \end{bmatrix}, \begin{bmatrix} 3 \\ 1 \\ 7 \end{bmatrix}$
- d. $\begin{bmatrix} 1 \\ 0 \\ 2 \end{bmatrix}, \begin{bmatrix} 3 \\ 1 \\ 7 \end{bmatrix}$

The correct answer is: $\begin{bmatrix} 1 \\ 0 \\ 2 \end{bmatrix}, \begin{bmatrix} 3 \\ 1 \\ 7 \end{bmatrix}$

Question **13**

Not answered

Marked out of 1.00

If A is an $n \times m$ matrix, and the columns of A span R^n then the linear system $Ax = b$ is consistent for every $b \in R^n$.

Select one:

- True
- False

The correct answer is 'True'.

Question **14**

Not answered

Marked out of 2.00

Let S be a finite subset of a subspace W of R^n. Then S is a basis for W if

Select one:

a. S is linearly independent

b. S spans W

c. every vector in W is a linear combination of vectors in S

d. None.

The correct answer is:
None.

Question **15**

Not answered

Marked out of 2.00

Let V and W be sub-spaces of R^n such that V is contained in W. Then

Select one:

a. every basis of W contains a basis of V.

b. V and W may have the same dimension even though they need not be equal

c. None

d. every basis for V can be extended to a basis for W

The correct answer is: every basis for V can be extended to a basis for W

Question **16**

Not answered

Marked out of 2.00

For any vector space V,

Select one:

a. If V is finite-dimensional, then V is a subspace of R^n for some positive integer n

b. If V is infinite-dimensional, then every infinite subset of V is linearly independent

c. None

d. If V is finite-dimensional, then no infinite subset of V is linearly independent.

The correct answer is:

If V is finite-dimensional, then no infinite subset of V is linearly independent.

Question **17**

Not answered

Marked out of 2.00

The dimension of the subspace $S=\{(a+b+2c, a+2b+4c, b+2c)^T, a, b, c\in R\}$ is

Select one:

- a. 1
- b. 4
- c. 3
- d. 2

The correct answer is: 2

Question **18**

Not answered

Marked out of 1.00

The interval $S=[-1,1]$ is a subspace of $V=R$

Select one:

- True
- False

The correct answer is 'False'.

Question **19**

Not answered

Marked out of 2.00

An $n \times n$ matrix A is invertible if

Select one:

- a. all of the above.
- b. The rows of A are li
- c. The columns of A are li
- d. $N(A) = \{\mathbf{0}\}$

Dc

The correct answer is: all of the above.

Question **20**

Not answered

Marked out of 1.00

The vector space of real numbers R has infinitely many subspaces

Select one:

- True
- False

The correct answer is 'False'.

Question **21**

Not answered

Not graded

Let $V = \{f \in P_4 : f(0) = f(1) = 0\}$

1. Show V is a subspace of P_4
2. Find a basis for V

◄ Practice ch4

Jump to...

Practice ch6 ►

INTRODUCTION TO LINEAR ALGEBRA-Lecture-1201 - 1

Dashboard / My courses / INTRODUCTION TO LINEAR ALGEBRA-Lecture-1201 - 1 / General / Quiz 1

Started on	Monday, 19 October 2020, 12:50 PM
State	Finished
Completed on	Monday, 19 October 2020, 1:02 PM
Time taken	12 mins 18 secs
Marks	25.00/25.00
Grade	**10.00** out of 10.00 (**100**%)

Question **1**
Correct
Mark 3.00 out of 3.00
Flag question

If $(A|b) = \left[\begin{array}{ccc|c} 1 & 0 & 2 & 1 \\ -1 & 1 & -1 & 0 \\ -1 & 0 & \alpha & \beta \end{array}\right]$ is the augmented matrix of the system $Ax = b$. Answer the following questions.

The system has no solution if

- $\alpha = -2$ and $\beta \neq -1$ ✔
- $\alpha = -2$ and $\beta = -1$
- $\alpha \neq -2$ and $\beta \neq -1$
- $\alpha \neq -2$ and $\beta = -1$

The system has exactly one solution if

- $\alpha = -2$ and $\beta = -1$
- $\alpha \neq -2$ ✔
- $\alpha = -2$
- $\alpha \neq -2$ and $\beta \neq -1$

The system has infinitely many solutions if

- $\alpha \neq -2$ and $\beta \neq -1$
- $\alpha = -2$ and $\beta \neq -1$
- $\alpha = -2$ and $\beta = -1$ ✔
- $\alpha \neq -2$ and $\beta = -1$

Question **2**
Correct
Mark 2.00 out of 2.00
Flag question

Let $A = \begin{bmatrix} 1 & 2 & 1 \\ -1 & 1 & 0 \\ 1 & 8 & 1 \end{bmatrix}$. If we want to find the LU factorization of A, then $L =$

Select one:

a. $\begin{bmatrix} 1 & 0 & 0 \\ -1 & 1 & 0 \\ 1 & 2 & 1 \end{bmatrix}$ ✔

b. $\begin{bmatrix} 1 & 0 & 0 \\ -1 & 1 & 0 \\ 1 & 8 & 1 \end{bmatrix}$

c. $\begin{bmatrix} 1 & 0 & 0 \\ 1 & 1 & 0 \\ -1 & -2 & 1 \end{bmatrix}$

d. $\begin{bmatrix} 1 & 0 & 0 \\ 1 & 1 & 0 \\ -1 & -8 & 1 \end{bmatrix}$

Question **3**
Correct
Mark 2.00 out of 2.00
Flag question

If a matrix A is nonsingular, then the matrix A^T is also nonsingular.

Select one:
a. True ✔
b. False

Question **4**
Correct
Mark 2.00 out of 2.00
Flag question

If $Ax = b$ is an overdetermined and consistent linear system, then it must have infinitely many solutions.

Select one:
a. True
b. False ✔

Question **5**
Correct
Mark 2.00 out of 2.00
Flag question

If a matrix is in row echelon form, then it is also in reduced row echelon form.

Select one:
a. True
b. False ✔

Question **6**
Correct
Mark 2.00 out of 2.00
Flag question

If A and B are $n \times n$ nonsingular matrices, then AB is also nonsingular.

Select one:
a. True ✔
b. False

Question **7**
Correct
Mark 2.00 out of 2.00
Flag question

The sum of two $n \times n$ nonsingular matrices is also nonsingular.

Select one:
a. True
b. False ✔

Question **8**
Correct
Mark 2.00 out of 2.00
Flag question

If a system of linear equations is undetermined, then it must have infinitely many solutions.

Select one:
a. True
b. False ✔

Question **9**
Correct
Mark 2.00 out of 2.00
Flag question

If a matrix A is row equivalent to I, then A is nonsingular.

Select one:
a. True ✔
b. False

Question **10**
Correct
Mark 2.00 out of 2.00
Flag question

Let A be a 3×3 matrix and suppose that $A\begin{bmatrix} 1 \\ 0 \\ 0 \end{bmatrix} = \begin{bmatrix} 0 \\ 0 \\ 0 \end{bmatrix}$. Then

Select one:
a. $Ax = 0$ has infinitely many solutions ✔
b. $Ax = (1, 0, 0)^T$ has infinitely many solutions
c. A is nonsingular
d. None of the above

Question **11**
Correct
Mark 2.00 out of 2.00
Flag question

A homogeneous system can have a nontrivial solution.

Select one:
a. True ✔
b. False

Question **12**
Correct
Mark 2.00 out of 2.00
Flag question

The inverse of an elementary matrix is also an elementary matrix.

Select one:
a. True ✔
b. False

Finish review

Math234/1

Jump to...

Quiz navigation

1 2 3 4 5 6 7 8 9 10 11 12

Show one page at a time

Finish review

Started on	Thursday, 1 April 2021, 9:30 AM
State	Finished
Completed on	Thursday, 1 April 2021, 9:45 AM
Time taken	14 mins 56 secs
Grade	**6** out of 6 (**100**%)

Question **1**

Correct

Mark 1 out of 1

If A is an invertible $n \times n$ matrix, $b \in \mathbb{R}^n$, then

Select one:

a. The system $Ax = b$ is consistent ✔

b. The system $Ax = b$ has infinitely many solutions

c. The system $Ax = b$ is inconsistent

d. The system $Ax = b$ has only two solutions

The correct answer is: The system $Ax = b$ is consistent

Question **2**

Correct

Mark 1 out of 1

If y, z are solutions to $Ax = b$, then $y - z$ is a solution of the system $Ax = 0$.

Select one:

a. False

b. True ✔

The correct answer is: True

Question **3**

Correct

Mark 1 out of 1

Let A be a 4×3-matrix with $a_2 = a_3$. If $b = a_1 + a_2 + a_3$, where a_j is the jth column of A, then a solution to the system $Ax = b$ is

Select one:

- a. $x = \begin{pmatrix} 1 \\ 2 \\ 1 \end{pmatrix}$
- b. $x = \begin{pmatrix} 1 \\ 2 \\ 2 \end{pmatrix}$
- c. $x = \begin{pmatrix} 1 \\ 0 \\ 2 \end{pmatrix}$ ✔
- d. $x = \begin{pmatrix} 1 \\ 1 \\ 2 \end{pmatrix}$

The correct answer is: $x = \begin{pmatrix} 1 \\ 0 \\ 2 \end{pmatrix}$

Question **4**

Correct

Mark 1 out of 1

If A and B are $n \times n$ matrices such that $Ax = Bx$ for some non zero $x \in \mathbb{R}^n$. Then

Select one:

- a. $A - B$ is singular. ✔
- b. A and B are nonsingular.
- c. A and B are singular.
- d. A, B are zero matrices.

The correct answer is: $A - B$ is singular.

Question **5**

Correct

Mark 1 out of 1

If$A = \begin{pmatrix} 2 & 4 & -1 \\ 4 & -2 & 0 \\ -1 & 1 & -1 \end{pmatrix}$ then the lower triangular matrix L in the LU-facrorization of A is given by

Select one:

- a. $L = \begin{pmatrix} 2 & 0 & 0 \\ 1 & \frac{-1}{2} & 0 \\ 1 & 1 & \frac{-3}{10} \end{pmatrix}$
- b. $L = \begin{pmatrix} 1 & 0 & 0 \\ 2 & 1 & 0 \\ \frac{-1}{2} & \frac{-3}{10} & 1 \end{pmatrix}$ ✔
- c. $L = \begin{pmatrix} 0 & 1 & 1 \\ 2 & 0 & 1 \\ \frac{-1}{2} & \frac{-3}{10} & 0 \end{pmatrix}$
- d. $L = \begin{pmatrix} 1 & 0 & 0 \\ -2 & 1 & 0 \\ \frac{1}{2} & \frac{3}{10} & 1 \end{pmatrix}$

The correct answer is: $L = \begin{pmatrix} 1 & 0 & 0 \\ 2 & 1 & 0 \\ \frac{-1}{2} & \frac{-3}{10} & 1 \end{pmatrix}$

Question **6**

Correct

Mark 1 out of 1

Any two $n \times n$-nonsingular matrices are row equivalent.

Select one:

- a. False
- b. True ✔

The correct answer is: True

◀ Short Exam 1

Jump to...

ZOOM Online Meetings ▶

Data retention summary

Started on	Thursday, 1 April 2021, 9:30 AM
State	Finished
Completed on	Thursday, 1 April 2021, 9:45 AM
Time taken	15 mins 1 sec
Grade	**4** out of 6 (**67**%)

Question **1**

Correct

Mark 1 out of 1

If A is a 3×3-matrix and the system $Ax = \begin{pmatrix} 5 \\ 1 \\ 3 \end{pmatrix}$ has a unique solution, then the system $Ax = \begin{pmatrix} 0 \\ 0 \\ 0 \end{pmatrix}$

Select one:

- a. has only the zero solution. ✔
- b. none of the above
- c. has infinitely many solutions
- d. is inconsistent

The correct answer is: has only the zero solution.

Question **2**

Incorrect

Mark 0 out of 1

If A and B are $n \times n$ matrices such that $Ax = Bx$ for some non zero $x \in \mathbb{R}^n$. Then

Select one:

- a. A and B are nonsingular. ✖
- b. A, B are zero matrices.
- c. A and B are singular.
- d. $A - B$ is singular.

The correct answer is: $A - B$ is singular.

Question **3**

Correct

Mark 1 out of 1

If y, z are solutions to $Ax = b$, then $\frac{1}{4}y + \frac{3}{4}z$ is a solution of the system $Ax = b$.

Select one:

- a. False
- b. True ✔

The correct answer is: True

Question **4**

Correct

Mark 1 out of 1

Let $A = \begin{pmatrix} 1 & 2 & 3 & 0 \\ 0 & -1 & 1 & 0 \\ 2 & 4 & 0 & 1 \end{pmatrix}$ and $b = \begin{pmatrix} 2 \\ 1 \\ 4 \end{pmatrix}$. The system $Ax = b$

Select one:

- a. is inconsistent
- b. has a unique solution
- c. has exactly three solutions.
- d. has infinitely many solutions ✔

The correct answer is: has infinitely many solutions

Question **5**

Correct

Mark 1 out of 1

If A is a 4×4-matrix, $b = \begin{pmatrix} 1 \\ 2 \\ 3 \\ 4 \end{pmatrix}$, and the system $Ax = b$ has a unique solution, then A is nonsingular

Select one:

- a. False
- b. True ✔

The correct answer is: True

Question 6

Incorrect

Mark 0 out of 1

If $A = \begin{pmatrix} 1 & -2 & 5 \\ 4 & -5 & 8 \\ -3 & 3 & -3 \end{pmatrix}$ and $b = \begin{pmatrix} b_1 \\ b_2 \\ b_3 \end{pmatrix}$, then the system $Ax = b$ is inconsistent if and only if

Select one:

- a. $b_2 - b_1 - b_3 \neq 0$
- b. $b_1 - b_2 - b_3 \neq 0$
- c. $b_3 - b_1 - b_2 \neq 0$
- d. $b_3 + b_1 + b_2 \neq 0$ ✖

The correct answer is: $b_1 - b_2 - b_3 \neq 0$

◄ Short Exam 1

Jump to...

ZOOM Online Meetings ►

Data retention summary

Started on	Tuesday, 9 March 2021, 1:41 PM
State	Finished
Completed on	Tuesday, 9 March 2021, 1:48 PM
Time taken	7 mins 21 secs
Marks	4.00/5.00
Grade	**8.00** out of 10.00 (**80**%)

Question **1**

Incorrect

Mark 0.00 out of 1.00

Let A be 3×3 be the coefficient matrix of the linear homogeous system $(A|b)$ such that A has two identical rows. Then $Ax = 0$ has infinite solutions.

Select one:

- True
- False ✖

The correct answer is 'True'.

Question **2**

Correct

Mark 1.00 out of 1.00

Let A be 3×3 be the coefficient matrix of the linear homogeous system $(A|0)$ such that A has two identical rows. Then $Ax = 0$ has a unique solution.

Select one:

- True
- False ✔

The correct answer is 'False'.

Question **3**

Correct

Mark 1.00 out of 1.00

If the row echelon form of the matrix ***A*** involves a free variable, then the linear system $(A|b)$ has infinitely many solutions.

Select one:

- True
- False ✔

The correct answer is 'False'.

Question **4**

Correct

Mark 1.00 out of 1.00

If $(A|b) = \begin{pmatrix} 1 & 1 & 2 & | & 4 \\ 2 & -1 & 2 & | & 6 \\ 3 & 0 & 4 & | & 1 \end{pmatrix}$ is the Augmented matrix of a linear system, then the system does not have infinitely many solutions.

Select one:

- True ✔
- False

The correct answer is 'True'.

Question **5**

Correct

Mark 1.00 out of 1.00

A homogeneous system is always consistent.

Select one:

- True ✔
- False

The correct answer is 'True'.

◀ Recording 7

Jump to...

Quiz2 ▶

Data retention summary

INTRODUCTION TO LINEAR ALGEBRA-Lecture-1201 - 1

Started on	Wednesday, 23 December 2020, 12:48 PM
State	Finished
Completed on	Wednesday, 23 December 2020, 12:58 PM
Time taken	10 mins 45 secs
Marks	18.00/18.00
Grade	**10.00** out of 10.00 (**100**%)

Question **1**
Correct
Mark 2.00 out of 2.00
Flag question

Suppose that a vector space V contains n linearly independent vectors, then

Select one:
- a. If a set S spans V then S must contain at most n vectors
- b. Any n vectors in V are linearly independent
- c. Any set containing more than n vectors is linearly dependent
- d. If a set S spans V then S must contain at least n vectors ✔

The correct answer is: If a set S spans V then S must contain at least n vectors

Question **2**
Correct
Mark 2.00 out of 2.00
Flag question

One of the following is not a basis for P_3:

Select one:
- a. $\{x, x^2+3, x^2-5\}$
- b. $\{1, 2x, x^2-x\}$
- c. $\{x^2+1, x^2-1, 2\}$ ✔
- d. $\{x-1, x^2+1, x^2-1\}$

The correct answer is: $\{x^2+1, x^2-1, 2\}$

Question **3**
Correct
Mark 2.00 out of 2.00
Flag question

If V is a vector space with $\dim(V)=n$, then

Select one:
- a. Any set containing less than n vectors must be linearly independent.
- b. Any spanning set for V must contain at most n vectors.
- c. Any n linearly independent vectors in V span V. ✔

The correct answer is: Any n linearly independent vectors in V span V.

Question **4**
Correct
Mark 2.00 out of 2.00
Flag question

$\dim(\mathrm{span}\{1-x, x^2, 3+x^2, 1+x^2\})$ equals

Select one:
- a. 2
- b. 0
- c. 1
- d. 3 ✔

The correct answer is: 3

Question **5**
Correct
Mark 2.00 out of 2.00
Flag question

The set of vectors $\{(1,a)^T, (b,1)^T\}$ is a spanning set for R^2 if

Select one:
- a. $a \neq b$
- b. $a \neq 1$ and $b \neq 1$
- c. $ab \neq 1$ ✔
- d. $ab = 1$

The correct answer is: $ab \neq 1$

Question **6**
Correct
Mark 2.00 out of 2.00
Flag question

The vectors e^x, xe^x, x are linearly independent in $C[0,1]$.

Select one:
- a. False
- b. True ✔

The correct answer is: True

Question **7**
Complete
Not graded
Flag question

If x_1 and x_2 are linearly independent in R^3, then $\exists x \in R^3$ such that span $\{x_1, x_2, x\} = R^3$.

Select one:
- a. True
- b. False

The correct answer is: True

Question **8**
Correct
Mark 2.00 out of 2.00
Flag question

Let $f, g, h \in C^2[a,b]$, if $W[f,g,h](x) = 0$ for all $x \in [a,b]$, then f, g, h are linearly dependent in $C[a,b]$

Select one:
- a. True
- b. False ✔

The correct answer is: False

Question **9**
Correct
Mark 2.00 out of 2.00
Flag question

If V is a vector space with $\dim(V)=n$, then any $n+1$ vectors in V are linearly dependent.

Select one:
- a. False
- b. True ✔

The correct answer is: True

Question **10**
Correct
Mark 2.00 out of 2.00
Flag question

If $\{v_1, v_2, \cdots, v_n\}$ are linearly independent in a vector space V, then V is finite-dimensional.

Select one:
- a. True
- b. False ✔

The correct answer is: False

Question **11**
Complete
Not graded
Flag question

Let V is a vector space with $\dim(V)=4$, if $v_1, v_2, v_3, v_4 \in V$, then span $\{v_1, v_2, v_3, v_4\} = V$.

Select one:
- a. False
- b. True

The correct answer is: False

Finish review

Quiz 1

Jump to...

Section 2.2 and part of 2.3

Quiz navigation

1 2 3 4 5 6 7 8 9 10 11

Show one page at a time

Finish review

Contact us

PO Box 14, Birzeit, West Bank, Palestine
Phone : +97(0/2)-2-2982000
E-mail : help@ritaj.ps

INTRODUCTION TO LINEAR ALGEBRA-Lecture-1201 - 1

Started on	Wednesday, 20 January 2021, 12:50 PM
State	Finished
Completed on	Wednesday, 20 January 2021, 1:00 PM
Time taken	10 mins 24 secs
Marks	22.00/22.00
Grade	**10.00** out of 10.00 (**100**%)

Question **1**
Correct
Mark 2.00 out of 2.00
Flag question

If A is a 3×3 matrix and $\lambda_1 = 1$ and $\lambda_2 = 1 + i$ are eigenvalues of A, then the third eigenvalue of A is

Select one:
- a. -1
- b. $1 - i$ ✔
- c. 0
- d. $-1 + i$

The correct answer is: $1 - i$

Question **2**
Correct
Mark 2.00 out of 2.00
Flag question

If the characteristic polynomial of a 3×3 matrix is $(2 - \lambda)^3$, then the trace of A is 6.

Select one:
- a. False
- b. True ✔

The correct answer is: True

Question **3**
Correct
Mark 2.00 out of 2.00
Flag question

The matrix $\begin{bmatrix} 0 & 0 & 0 \\ 1 & 1 & 0 \\ 7 & -4 & -1 \end{bmatrix}$ is diagonalizable

Select one:
- a. True ✔
- b. False

The correct answer is: True

Question **4**
Correct
Mark 2.00 out of 2.00
Flag question

One of the following is not a linear transformation.

Select one:
- a. $L : \mathbb{R}^2 \longrightarrow \mathbb{R}^3; L((x, y)^T) = (x, y, 0)^T$.
- b. $L : P_2 \longrightarrow \mathbb{R}; L(p(x)) = 0$.
- c. $L : P_2 \longrightarrow \mathbb{R}^2; L(ax + b) = (0, a + b)^T$.
- d. $L : P_2 \longrightarrow P_3; L(p(x)) = xp(x) + 1$. ✔

The correct answer is: $L : P_2 \longrightarrow P_3; L(p(x)) = xp(x) + 1$.

Question **5**
Correct
Mark 2.00 out of 2.00
Flag question

If $L : V \rightarrow W$ is a linear transformation, then $L(2v) = 2L(v)$ for every vector $v \in V$.

Select one:
- a. False
- b. True ✔

The correct answer is: True

Question **6**
Correct
Mark 2.00 out of 2.00
Flag question

let $L : R^4 \rightarrow R^2$ be given by $L((x_1, x_2, x_3, x_4)^T = (x_1 + x_2 + x_3, x_3 + x_4)^T$,then dim(range (L)) equals

Select one:
- a. 3
- b. 2 ✔
- c. 4
- d. 1

The correct answer is: 2

Question **7**
Correct
Mark 2.00 out of 2.00
Flag question

If a 3×3 matrix A is diagonalizable, then A has 3 distinct eigenvalues.

Select one:
- a. False ✔
- b. True

The correct answer is: False

Question **8**
Correct
Mark 2.00 out of 2.00
Flag question

let $L : R^4 \rightarrow R^2$ be given by $L((x_1, x_2, x_3, x_4)^T = (x_1 + x_2 + x_3, x_3 + x_4)^T$, then dim(ker (L)) equals

Select one:
- a. 2 ✔
- b. 4
- c. 3
- d. 1

The correct answer is: 2

Question **9**
Correct
Mark 2.00 out of 2.00
Flag question

If A is an $n \times n$ diagonalizable matrix, then

Select one:
- a. A has n distinct eigenvalues
- b. A is singular
- c. A has n linearly independent eigenvectors ✔

The correct answer is: A has n linearly independent eigenvectors

Question **10**
Correct
Mark 2.00 out of 2.00
Flag question

One of the following is a linear operator on P_3

Select one:
- a. $L(p(x)) = p(x) - x$
- b. $L(p(x)) = p(x)$ ✔
- c. $L(p(x)) = p(x) + 1$
- d. $L(p(x)) = p'(x) + x$

The correct answer is: $L(p(x)) = p(x)$

Question **11**
Correct
Mark 2.00 out of 2.00
Flag question

If $\lambda = 0$ is an eigenvalue of an $n \times n$ matrix A, then A is singular.

Select one:
- a. True ✔
- b. False

The correct answer is: True

Finish review

◀ Quiz 2

Jump to...

Section 2.2 and part of 2.3 ▶

Quiz navigation

1 ✔ 2 ✔ 3 ✔ 4 ✔ 5 ✔ 6 ✔ 7 ✔ 8 ✔ 9 ✔ 10 ✔ 11 ✔

Show one page at a time

Finish review

Started on	Saturday, 29 May 2021, 5:00 PM
State	Finished
Completed on	Saturday, 29 May 2021, 5:14 PM
Time taken	14 mins 54 secs
Grade	**3** out of 6 (**50**%)

Question **1**

Correct

Mark 1 out of 1

Every spanning set for $\mathbb{R}^3$ contains at least 3 vectors.

Select one:

a. False

b. True ✔

The correct answer is: True

Question **2**

Incorrect

Mark 0 out of 1

If $\{v_1, v_2, v_3, v_4\}$ forms a spanning set for a vector space V, v_4 can be written as a linear combination of v_1, v_2, v_3, then

Select one:

a. $\{v_1, v_2, v_3\}$ is a spanning set of V.

b. $\{v_1, v_2, v_3\}$ are linearly dependent in V.

c. $\{v_1, v_2, v_3\}$ is not a spanning set of V. ✘

d. $\{v_1, v_2, v_3\}$ are linearly independent in V.

The correct answer is: $\{v_1, v_2, v_3\}$ is a spanning set of V.

Question **3**

Incorrect

Mark 0 out of 1

The vectors $\{t-1, t^2+2t+1, t^2+t-2\}$ in P_3 are

Select one:

- a. linearly independent
- b. linearly dependent ✖

The correct answer is: linearly independent

Question **4**

Incorrect

Mark 0 out of 1

dim$\left(\text{span}(x^2, 3+x^2, x^2+1)\right)$ is

Select one:

- a. 0
- b. 3 ✖
- c. 1
- d. 2

The correct answer is: 2

Question **5**

Correct

Mark 1 out of 1

The vectors $\{2, x, \sin x\}$ in $C[0, 2\pi]$ are

Select one:

- a. linearly independent ✔
- b. linearly dependent

The correct answer is: linearly independent

Question 6

Correct

Mark 1 out of 1

If $\{v_1, \cdots, v_n\}$ are linearly independent and v is not in Span$\{v_1, \cdots, v_n\}$, then $\{v_1, \cdots, v_n, v\}$ are linearly independent.

Select one:

- a. True
- b. False

The correct answer is: True

◄ Quiz 4 (6-6-2021)

Jump to...

Short Exam 1 ►

Data retention summary

Started on	Thursday, 1 April 2021, 1:40 PM
State	Finished
Completed on	Thursday, 1 April 2021, 2:03 PM
Time taken	23 mins 31 secs
Grade	**11.00** out of 13.00 (**85**%)

Question **1**

Correct

Mark 1.00 out of 1.00

Let A be $n \times n$. If A has an $LU-$factorization then A is row equivalent to U.

Select one:

- True ✔
- False

The correct answer is 'True'.

Question **2**

Correct

Mark 1.00 out of 1.00

Let A be $n \times n$. If A has an $LU-$factorization then A is nonsingular iff L is nonsingular.

Select one:

- True
- False ✔

The correct answer is 'False'.

Question **3**

Correct

Mark 1.00 out of 1.00

The LU decomposition of the matrix $\begin{bmatrix} 2 & 4 & 2 \\ 1 & 5 & 2 \\ 4 & -1 & 9 \end{bmatrix}$ is

Select one:

- a. $L = \begin{bmatrix} 1 & 0 & 0 \\ -\frac{1}{2} & 1 & 0 \\ -2 & -3 & 1 \end{bmatrix}, U = \begin{bmatrix} 2 & 4 & 2 \\ 0 & 3 & 1 \\ 0 & 0 & 8 \end{bmatrix}$
- b. $L = \begin{bmatrix} 1 & 0 & 0 \\ \frac{1}{2} & 1 & 0 \\ 2 & -3 & 1 \end{bmatrix}, U = \begin{bmatrix} 2 & 4 & 2 \\ 0 & 3 & 1 \\ 0 & 0 & 8 \end{bmatrix}$ ✔
- c. $L = \begin{bmatrix} 1 & 0 & 0 \\ -\frac{1}{2} & 1 & 0 \\ 2 & 3 & 1 \end{bmatrix}, U = \begin{bmatrix} 2 & 4 & 2 \\ 0 & 3 & 1 \\ 0 & 0 & 8 \end{bmatrix}$
- d. None

The correct answer is: $L = \begin{bmatrix} 1 & 0 & 0 \\ \frac{1}{2} & 1 & 0 \\ 2 & -3 & 1 \end{bmatrix}, U = \begin{bmatrix} 2 & 4 & 2 \\ 0 & 3 & 1 \\ 0 & 0 & 8 \end{bmatrix}$

Question **4**

Correct

Mark 1.00 out of 1.00

If E is an elementary matrix then one of the following statements is not true

Select one:

- a. E^{-1} is an elementary matrix.
- b. $E + E^T$ is an elementary matrix. ✔
- c. E^T is an elementary matrix.
- d. E is nonsingular.

The correct answer is: $E + E^T$ is an elementary matrix.

Question **5**

Incorrect

Mark 0.00 out of 1.00

If $A^2 = I$ then

Select one:

- a. $A - I$ and $A + I$ are singular.
- b. $A - I$ and $A + I$ are nonsingular.
- c. $A - I$ and $A + I$ both cannot be nonsingular.
- d. none ✖

The correct answer is: $A - I$ and $A + I$ both cannot be nonsingular.

Question **6**

Correct

Mark 1.00 out of 1.00

If A an 3×3 matrix such that $Ax = 0$ for a nonzero x, then

Select one:

- a. A is nonsingular
- b. A is row equivalent to the identity
- c. A is singular. ✔
- d. none

The correct answer is: A is singular.

Question **7**

Correct

Mark 1.00 out of 1.00

A square matrix ***A*** is nonsingular *iff* its *REF* is the identity matrix.

Select one:

- True
- False ✔

The correct answer is 'False'.

Question **8**

Incorrect

Mark 0.00 out of 1.00

Let A be $n \times n$. If A has an $LU-$factorization then A is nonsingular iff U is nonsingular.

Select one:

- True
- False ✖

The correct answer is 'True'.

Question **9**

Correct

Mark 1.00 out of 1.00

If A and B are $n \times n$ matrices such that $Ax = Bx$ for some non zero $x \in R^n$. Then

Select one:

- a. $A - B$ is singular. ✔
- b. none.
- c. A and B are nonsingular.
- d. A and B are singular.

The correct answer is: $A - B$ is singular.

Question **10**

Correct

Mark 1.00 out of 1.00

Let A be a 4×4 matrix. If the homogeneous system $Ax = 0$ has only the trivial solution then

Select one:

- a. A is nonsingular.
- b. A is row equivalent to I.
- c. RREF of A is I.
- d. all of the above. ✔

The correct answer is: all of the above.

Question **11**

Correct

Mark 1.00 out of 1.00

If ***A* = *LU*** is the LU-factorization and **U** is singular then **A** is singular.

Select one:

- True ✔
- False

The correct answer is 'True'.

Question **12**

Correct

Mark 1.00 out of 1.00

Let A be $n \times n$. Then A always has an LU factorization.

Select one:

- True
- False ✔

The correct answer is 'False'.

Question **13**

Correct

Mark 1.00 out of 1.00

If ***A*,*B*** are square **n × n** matrices such that ***AB=0***, then **A** and **B** are singular.

Select one:

- True
- False ✔

The correct answer is 'False'.

◀ Quiz2

Jump to...

quiz4 ▶

Data retention summary

Dashboard / My courses / INTRODUCTION TO LINEAR ALGEBRA-Lecture-1202 - MATH234 - 1 / General / Quiz 3

Started on	Saturday, 29 May 2021, 5:00 PM
State	Finished
Completed on	Saturday, 29 May 2021, 5:14 PM
Time taken	14 mins 30 secs
Grade	**6** out of 6 (**100**%)

Question **1**
Correct
Mark 1 out of 1

Let V be a vector space of dimension 4 and $W = \{v_1, v_2, v_3, v_4, v_5\}$ a set of nonzero vectors of V, then

Select one:
- a. W is a spanning set
- b. W is a basis
- c. W is linearly independent
- d. W is linearly dependent ✔

The correct answer is: W is linearly dependent

Question **2**
Correct
Mark 1 out of 1

If $\{v_1, v_2, v_3, v_4\}$ is a basis for a vector space V, then the set $\{v_1, v_2, v_3\}$ is

Select one:
- a. linearly independent and not a spanning set for V. ✔
- b. linearly dependent and not a spanning set for V.
- c. linearly dependent and a spanning set
- d. linearly independent and a spanning set for V.

The correct answer is: linearly independent and not a spanning set for V.

Question **3**

Correct

Mark 1 out of 1

If $\{v_1, v_2, v_3, v_4\}$ forms a spanning set for a vector space V, v_4 can be written as a linear combination of v_1, v_2, v_3, then

Select one:

- a. $\{v_1, v_2, v_3\}$ are linearly independent in V.
- b. $\{v_1, v_2, v_3\}$ are linearly dependent in V.
- c. $\{v_1, v_2, v_3\}$ is a spanning set of V. ✔
- d. $\{v_1, v_2, v_3\}$ is not a spanning set of V.

The correct answer is: $\{v_1, v_2, v_3\}$ is a spanning set of V.

Question **4**

Correct

Mark 1 out of 1

The vectors $\{x+1, x^2-2x-1, x^2-x+2\}$ form a basis for P_3.

Select one:

- a. False
- b. True ✔

The correct answer is: True

Question **5**

Correct

Mark 1 out of 1

If $v_1, v_2, \cdots, v_n$ are linearly independent vectors in a vector space V, and $c_1v_1+c_2v_2+\cdots+c_nv_n=0$, then $c_1, c_2, \cdots, c_n$ are all zero scalars.

Select one:

- a. False
- b. True ✔

The correct answer is: True

Question **6**

Correct

Mark 1 out of 1

Let $S = \left\{ \begin{matrix} pmatrix a+b \\ a+b \\ a+b[\backslash \mathrm{end?}]pmatrix : a,b \in \mathbb{R} \end{matrix} \right\}$. Then dimension of S equals

Select one:

- a. 2
- b. 1
- c. 0
- d. 3

The correct answer is: 1

◄ Quiz 4 (6-6-2021)

Jump to...

Short Exam 1 ►

Data retention summary

Started on	Sunday, 6 June 2021, 4:00 PM
State	Finished
Completed on	Sunday, 6 June 2021, 4:14 PM
Time taken	14 mins 45 secs
Grade	**5.00** out of 6.00 (**83**%)

Question **1**

Correct

Mark 1.00 out of 1.00

The coordinate vector of $\begin{pmatrix} 3 \\ 2 \\ 5 \end{pmatrix}$ with respect to the ordered basis $\left[\begin{pmatrix} 1 \\ 1 \\ 1 \end{pmatrix}, \begin{pmatrix} 1 \\ 2 \\ 2 \end{pmatrix}, \begin{pmatrix} 2 \\ 3 \\ 4 \end{pmatrix} \right]$ is

Select one:

a. $\begin{pmatrix} 1 \\ -4 \\ 3 \end{pmatrix}$

b. $\begin{pmatrix} 1 \\ 2 \\ 3 \end{pmatrix}$

c. $\begin{pmatrix} 3 \\ 2 \\ 5 \end{pmatrix}$

d. $\begin{pmatrix} -1 \\ 4 \\ -3 \end{pmatrix}$

The correct answer is: $\begin{pmatrix} 1 \\ -4 \\ 3 \end{pmatrix}$

Question **2**

Correct

Mark 1.00 out of 1.00

Let A be a 4×5-matrix, with rank$(A) = 3$. Then The rows of A are linearly independent.

Select one:

- a. False ✔
- b. True

The correct answer is: False

Question **3**

Correct

Mark 1.00 out of 1.00

If $A = \begin{pmatrix} 1 & 2 & -1 & 0 \\ -1 & -2 & 2 & 0 \\ 2 & 4 & 0 & 0 \end{pmatrix}$, then rank$(A) = 3$.

Select one:

- a. True
- b. False ✔

The correct answer is: False

Question **4**

Incorrect

Mark 0.00 out of 1.00

If A is a nonzero 5×2-matrix and $Ax = 0$ has infinitely many solutions, then rank$(A) =$

Select one:

- a. 5
- b. 3
- c. 1
- d. 2 ✖

The correct answer is: 1

Question **5**

Correct

Mark 1.00 out of 1.00

If A is a 4×4-matrix, and $Ax = 0$ has only the zero solution, then rank$(A) =$

Select one:

- a. 3
- b. 1
- c. 4 ✔
- d. 2

The correct answer is: 4

Question **6**

Correct

Mark 1.00 out of 1.00

If the columns of $A_{n \times n}$ are linearly independent and $b \in \mathbb{R}^n$, then the system $Ax = b$ has

Select one:

- a. infinitely many solutions
- b. exactly 2 solutions
- c. no solution
- d. exactly one solution ✔

The correct answer is: exactly one solution

Jump to...

Quiz 3 ▶

Data retention summary

Started on	Sunday, 6 June 2021, 4:05 PM
State	Finished
Completed on	Sunday, 6 June 2021, 4:20 PM
Time taken	14 mins 53 secs
Grade	**6.00** out of 6.00 (**100**%)

Question **1**

Correct

Mark 1.00 out of 1.00

If A is a 4×4-matrix, and $Ax = 0$ has only the zero solution, then rank$(A) =$

Select one:

- a. 4
- b. 1
- c. 2
- d. 3

The correct answer is: 4

Question **2**

Correct

Mark 1.00 out of 1.00

The coordinate vector of $8 + 6x$ with respect to the basis $[2x, 4]$ is $(3, 2)^T$

Select one:

- a. True
- b. False

The correct answer is: True

Question **3**

Correct

Mark 1.00 out of 1.00

If $A = \begin{pmatrix} 1 & 2 & -1 & 0 \\ -1 & -2 & 2 & 0 \\ 2 & 4 & 0 & 0 \end{pmatrix}$, then rank$(A) = 3.$

Select one:

- a. True
- b. False ✔

The correct answer is: False

Question **4**

Correct

Mark 1.00 out of 1.00

If A is a 5×7 matrix, then nullity of $A \geq 2.$

Select one:

- a. False
- b. True ✔

The correct answer is: True

Question **5**

Correct

Mark 1.00 out of 1.00

If A is an $n \times n$-matrix and for each $b \in \mathbb{R}^n$ the system $Ax = b$ has a unique solution, then

Select one:

- a. A is singular
- b. A is nonsingular ✔
- c. nullity$(A) = 1$
- d. rank$(A) = n - 1$

The correct answer is: A is nonsingular

Question 6

Correct

Mark 1.00 out of 1.00

If A is a nonzero 5×2-matrix and $Ax = 0$ has infinitely many solutions, then rank$(A) =$

Select one:

- a. 2
- b. 3
- c. 1
- d. 5

The correct answer is: 1

Jump to...

Quiz 3 ►

Data retention summary

Started on	Thursday, 1 April 2021, 9:30 AM
State	Finished
Completed on	Thursday, 1 April 2021, 9:45 AM
Time taken	15 mins 1 sec
Grade	**5** out of 6 (**83**%)

Question **1**

Correct

Mark 1 out of 1

If $A = \begin{pmatrix} 2 & 4 & -1 \\ 4 & -2 & 0 \\ -1 & 1 & -1 \end{pmatrix}$ then the lower triangular matrix L in the LU-facrorization of A is given by

Select one:

a. $L = \begin{pmatrix} 1 & 0 & 0 \\ -2 & 1 & 0 \\ \frac{1}{2} & \frac{3}{10} & 1 \end{pmatrix}$

b. $L = \begin{pmatrix} 0 & 1 & 1 \\ 2 & 0 & 1 \\ \frac{-1}{2} & \frac{-3}{10} & 0 \end{pmatrix}$

c. $L = \begin{pmatrix} 1 & 0 & 0 \\ 2 & 1 & 0 \\ \frac{-1}{2} & \frac{-3}{10} & 1 \end{pmatrix}$ ✔

d. $L = \begin{pmatrix} 2 & 0 & 0 \\ 1 & \frac{-1}{2} & 0 \\ 1 & 1 & \frac{-3}{10} \end{pmatrix}$

The correct answer is: $L = \begin{pmatrix} 1 & 0 & 0 \\ 2 & 1 & 0 \\ \frac{-1}{2} & \frac{-3}{10} & 1 \end{pmatrix}$

Question **2**

Correct

Mark 1 out of 1

If A is a singular 3×3-matrix, then the reduced row echelon form of A has 2 rows of zeros.

Select one:

- a. False
- b. True

The correct answer is: False

Question **3**

Correct

Mark 1 out of 1

Assume that the last row in the reduced row echelon form of a 4×4 linear system is $[0 \quad 0 \quad 0 \quad a-3|b-4]$. The system is inconsistent if

Select one:

- a. $a = 3$ and $b \neq 4$.
- b. $a = 3, b = 4$.
- c. $a \neq 3$.
- d. $b \neq 4$.

The correct answer is: $a = 3$ and $b \neq 4$.

Question **4**

Correct

Mark 1 out of 1

If A is a 4×4-matrix, $b = \begin{pmatrix} 1 \\ 2 \\ 3 \\ 4 \end{pmatrix}$, and the system $Ax = b$ has a unique solution, then A is nonsingular

Select one:

- a. False
- b. True

The correct answer is: True

Question **5**

Correct

Mark 1 out of 1

If A is an invertible $n \times n$ matrix, $b \in \mathbb{R}^n$, then

Select one:

- a. The system $Ax = b$ has infinitely many solutions
- b. The system $Ax = b$ is consistent ✔
- c. The system $Ax = b$ has only two solutions
- d. The system $Ax = b$ is inconsistent

The correct answer is: The system $Ax = b$ is consistent

Question **6**

Incorrect

Mark 0 out of 1

In the linear system $Ax = 0$, if $a_1 = a_2 + 3a_4$ then $x = \begin{pmatrix} -1 \\ 1 \\ 3 \end{pmatrix}$ is a solution to $Ax = 0$.

Select one:

- a. True ✖
- b. False

The correct answer is: False

Dashboard / My courses / INTRODUCTION TO LINEAR ALGEBRA-Lecture-1202 - MATH234 - 3 / Quizez / Quiz2

Started on	Tuesday, 23 March 2021, 1:35 PM
State	Finished
Completed on	Tuesday, 23 March 2021, 1:54 PM
Time taken	18 mins 56 secs
Grade	**13.00** out of 13.00 (**100**%)

Question **1**

Correct

Mark 1.00 out of 1.00

In the linear system $Ax = 0$, if $a_1 = a_2$ then the system has a unique solution.

Select one:

- True
- False ✔

The correct answer is 'False'.

Question **2**

Correct

Mark 1.00 out of 1.00

If z_0 is a solution of the non-homogeneous system $Ax = b$
and z_1 is a solution of the homogeneous system $Ax = 0$. Then $z_0 + z_1$ is a solution of $Ax = b$.

Select one:

- True ✔
- False

The correct answer is 'True'.

Question **3**

Correct

Mark 1.00 out of 1.00

Let A be 3×3 be the coefficient matrix of $Ax = b$ such that $a_1 = 3a_3$ and $a_1 - a_2 + 3a_3 = b$. Then $Ax = b$ has infinite solutions.

Select one:

- True ✔
- False

The correct answer is 'True'.

Question **4**

Correct

Mark 1.00 out of 1.00

If z_0, z_1 area solutions of the non-homogeneous system $Ax = b$. Then $z_0 + z_1$ is a solution of $Ax = b$

Select one:

- True
- False ✔

The correct answer is 'False'.

Question **5**

Correct

Mark 1.00 out of 1.00

Let A be 3×3 be the coefficient matrix of $Ax = 0$ such that $a_1 = 3a_3$ and $a_1 - a_2 + 3a_3 = 0$. Then the solutions of $Ax = 0$ are of the form $a(1, 0, -3)^t + b(1, -1, 3)^t$, where $a, b \in R$.

Select one:

- True ✔
- False

The correct answer is 'True'.

Question **6**

Correct

Mark 1.00 out of 1.00

If A, B are square $n \times n$ matrices, then $(A+B)(A-B) = A^2 - B^2$.

Select one:

- True
- False ✔

The correct answer is 'False'.

Question **7**

Correct

Mark 1.00 out of 1.00

In the linear system ***Ax=b***, if $b = a_1 - a_2 + 3a_4 = a_1$ then the system has infinite solutions.

Select one:

- True ✔
- False

The correct answer is 'True'.

Question **8**

Correct

Mark 1.00 out of 1.00

If ***A, B*** are square ***n × n*** matrices and ***AB*** is non-singular then ***A*** and ***B*** are non-singular.

Select one:

- True ✔
- False

The correct answer is 'True'.

Question **9**

Correct

Mark 1.00 out of 1.00

The vector $(0,0,0)^T$ is a linear combination of the vectors $(1,2,3)^T, (1,4,1)^T, (2,3,1)^T$

Select one:

- True ✔
- False

The correct answer is 'True'.

Question **10**

Correct

Mark 1.00 out of 1.00

If $AB = AC$, A is non-singular, then $B = C$.

Select one:

- True ✔
- False

The correct answer is 'True'.

Question **11**

Correct

Mark 1.00 out of 1.00

Let A be $n \times n$. Then A is nonsingular iff A^t is nonsingular.

Select one:

- True ✔
- False

The correct answer is 'True'.

Question **12**

Correct

Mark 1.00 out of 1.00

If the system ***Ax = b*** is inconsistent then ***b*** is not a linear combinations of the columns of ***A***.

Select one:

- True ✔
- False

The correct answer is 'True'.

Question **13**

Correct

Mark 1.00 out of 1.00

Let A be $n \times n.$ If A is nonsingular, then A^t is nonsingular.

Select one:

- True ✔
- False

The correct answer is 'True'.

◀ Quiz1

Jump to...

Quiz 3 ▶

Data retention summary

Started on	Saturday, 29 May 2021, 5:00 PM
State	Finished
Completed on	Saturday, 29 May 2021, 5:15 PM
Time taken	14 mins 51 secs
Grade	**5** out of 6 (**83**%)

Question **1**

Correct

Mark 1 out of 1

Let V be a vector space, $v_1, v_2, v_3 \in V$ such that v_1, v_2 are linearly independent, v_2, v_3 are linearly independent, then v_1, v_2, v_3 are linearly independent.

Select one:

- a. False ✔
- b. True

The correct answer is: False

Question **2**

Correct

Mark 1 out of 1

Let $S = \{ \begin{pmatrix} a+b \\ a+b \\ a+b \end{pmatrix} : a, b \in \mathbb{R}\}$. Then dimension of S equals

Select one:

- a. 2
- b. 1 ✔
- c. 0
- d. 3

The correct answer is: 1

Question **3**

Correct

Mark 1 out of 1

If V is a vector space and $\{v_1, v_2, \cdots, v_n\}$ is a spanning set for V and $v_{n+1} \in V$, then the set $\{v_1, v_2, \cdots, v_{n+1}\}$ is

Select one:

- a. not a spanning set.
- b. a spanning set.

The correct answer is: a spanning set.

Question **4**

Correct

Mark 1 out of 1

Every linearly independent set of vectors in $\mathbb{R}^4$ has exactly 4 vectors.

Select one:

- a. True
- b. False

The correct answer is: False

Question **5**

Incorrect

Mark 0 out of 1

Which of the following **is not a basis** for the corresponding space

Select one:

- a. $\{(1, -1)^T, (2, -3)^T\}$; $\mathbb{R}^2$
- b. $\{(1, -1, -1)^T, (2, -3, 0)^T, (-1, 0, 2)^T\}$; $\mathbb{R}^3$
- c. $\{x, 1-x, 2x+3\}$; P_3
- d. $\{5-x, x\}$; P_2

The correct answer is: $\{x, 1-x, 2x+3\}$; P_3

Question 6

Correct

Mark 1 out of 1

If $\{v_1, v_2, v_3, v_4\}$ forms a spanning set for a vector space V, dim$(V) = 3$, v_4 can be written as a linear combination of v_1, v_2, v_3, then

Select one:

- a. $\{v_1, v_2, v_3\}$ do not form a spanning set for V
- b. $\{v_1, v_2, v_3\}$ is a basis for V ✔
- c. v_1 can be written as a linear combination of v_2, v_3, v_4
- d. $\{v_1, v_2, v_3\}$ are linearly dependent

The correct answer is: $\{v_1, v_2, v_3\}$ is a basis for V

Jump to...

ZOOM Online Meetings ►

Data retention summary

Started on	Sunday, 6 June 2021, 4:04 PM
State	Finished
Completed on	Sunday, 6 June 2021, 4:19 PM
Time taken	14 mins 25 secs
Grade	**3.00** out of 6.00 (**50**%)

Question **1**

Incorrect

Mark 0.00 out of 1.00

Let $E = [2+x, 1-x, x^2+1]$ be an ordered basis for P_3. If $[p(x)]_E = \begin{pmatrix} 1 \\ -2 \\ 3 \end{pmatrix}$, then

Select one:

- a. $p(x) = 3x^2 + x - 2$
- b. $p(x) = 3x^2 - 2x + 1$
- c. $p(x) = 3x^2 + 3x + 3$
- d. $p(x) = x^2 - x + 5$ ✖

The correct answer is: $p(x) = 3x^2 + 3x + 3$

Question **2**

Incorrect

Mark 0.00 out of 1.00

If A is an $m \times n$-matrix, then rank(A) = rank(A^T).

Select one:

- a. True
- b. False ✖

The correct answer is: True

Question **3**

Correct

Mark 1.00 out of 1.00

If A is an $m \times n$ matrix, then

Select one:

- a. $\text{rank}(A) \leq \min\{m, n\}$ ✔
- b. $\text{rank}(A) \leq n$
- c. $\text{rank}(A) = m = n$
- d. $\text{rank}(A) \leq m$

The correct answer is: $\text{rank}(A) \leq \min\{m, n\}$

Question **4**

Correct

Mark 1.00 out of 1.00

If A is an $n \times n$-matrix and for each $b \in \mathbb{R}^n$ the system $Ax = b$ has a unique solution, then

Select one:

- a. A is singular
- b. $\text{rank}(A) = n - 1$
- c. $\text{nullity}(A) = 1$
- d. A is nonsingular ✔

The correct answer is: A is nonsingular

Question **5**

Incorrect

Mark 0.00 out of 1.00

If A is a nonzero 5×2-matrix and $Ax = 0$ has infinitely many solutions, then $\text{rank}(A) =$

Select one:

- a. 1
- b. 3
- c. 2 ✘
- d. 5

The correct answer is: 1

Question 6

Correct

Mark 1.00 out of 1.00

The rank of $A = \begin{pmatrix} 1 & 4 & 1 & 2 & 1 \\ 2 & 6 & -1 & 2 & -1 \\ 3 & 8 & -3 & 2 & -3 \end{pmatrix}$ is

Select one:

- a. 2
- b. 3
- c. 1
- d. 0

The correct answer is: 2

Started on	Thursday, 22 April 2021, 1:25 PM
State	Finished
Completed on	Thursday, 22 April 2021, 1:25 PM
Time taken	8 secs
Marks	1.00/1.00
Grade	**10.00** out of 10.00 (**100**%)

Question **1**

Correct

Mark 1.00 out of 1.00

The rank of a matrix A is the dimension of the row pace of A.

ANSWER IS TRUE

Select one:

- True ✔
- False

The correct answer is 'True'.

◄ Quiz6-short exam2

Jump to...

Practice-chapter 1 ►

Data retention summary

Dashboard / My courses / INTRODUCTION TO LINEAR ALGEBRA-Lecture-1202 - MATH234 - 3 / Quizez / Quiz6-short exam2

Started on	Tuesday, 4 May 2021, 12:10 PM
State	Finished
Completed on	Tuesday, 4 May 2021, 12:31 PM
Time taken	21 mins 32 secs
Overdue	6 mins 32 secs

Question **1**
Incorrect
Marked out of 1.00

If two vectors in a vector space V are linearly dependent, then each one of them is a scalar multiple of the other.

Select one:
- True ✖
- False

The correct answer is 'False'.

Question **2**
Correct
Marked out of 1.00

The vectors $(0,0,0)^T, (2,3,1)^T, (2,-5,3)^T$ are linearly dependent.

Select one:
- True ✔
- False

The correct answer is 'True'.

Question **3**

Correct

Marked out of 1.00

An $n \times n$ matrix A is invertible if

Select one:

- a. $N(A) = \{\mathbf{0}\}$
- b. The columns of A are li
- c. The rows of A are li
- d. all of the above. ✔

Your answer is correct.

The correct answer is: all of the above.

Question **4**

Correct

Marked out of 1.00

Any subset of a vector space that contains the zero vector is a subspace.

Select one:

- True
- False ✔

The correct answer is 'False'.

Question **5**

Correct

Marked out of 1.00

If A is an $n \times n$ invertible matrix, then the linear system $Ax = b$ is consistent for every $b \in R^n$.

Select one:

- True ✔
- False

The correct answer is 'True'.

Question **6**

Correct

Marked out of 1.00

If V is a vector space with dimension $n > 0$, then any set of m vectors in V does not span V.

Select one:

- True ✔
- False

The correct answer is 'True'.

Question **7**

Correct

Marked out of 1.00

Let u and v be distinct (not equal)vectors in a vector space V, and let B be a basis for V. Then

Select one:

- a. the coordinate vector of u with respect to B equals u
- b. None
- c. the coordinate vector of $u+v$ with respect to B never equals the sum of the coordinate vector of u and the coordinate vector of v with respect to B.
- d. the coordinate vector of $u+v$ with respect to B equals the sum of the coordinate vector of u and the coordinate vector of v with respect to B. ✔

Your answer is correct.

The correct answer is:
the coordinate vector of $u+v$ with respect to B equals the sum of the coordinate vector of u and the coordinate vector of v with respect to B.

Question **8**

Correct

Marked out of 1.00

Let S be a finite subset of a subspace W of R^n. Then S is a basis for W if

Select one:

- a. every vector in W is a linear combination of vectors in S
- b. S spans W
- c. None.
- d. S is linearly independent

Your answer is correct.

The correct answer is:
None.

Question 9

Correct

Marked out of 1.00

A basis for the Column space of

$$A = \begin{bmatrix} 1 & 2 & 3 & 0 & 1 \\ 0 & -1 & 1 & 0 & 0 \\ 2 & 3 & 7 & 0 & 2 \end{bmatrix}$$

is

Select one:

a. $\begin{bmatrix} 1 \\ 0 \\ 2[?][?] \end{bmatrix}, \begin{bmatrix} [?][?]3 \\ 1 \\ [?][?]7[?][?] \end{bmatrix}, \begin{bmatrix} [?][?]0 \\ 1 \\ [?][?]0 \end{bmatrix}$

b. $\begin{bmatrix} 1 \\ 0 \\ 2[?][?] \end{bmatrix}, \begin{bmatrix} [?][?]3 \\ 1 \\ [?][?]7[?][?] \end{bmatrix}$

c. $\begin{bmatrix} [?][?]3 \\ 1 \\ [?][?]7[?][?] \end{bmatrix}, \begin{bmatrix} [?][?]3 \\ 1 \\ [?][?]7[?][?] \end{bmatrix}$

d. None

Your answer is correct.

The correct answer is: $\begin{bmatrix} 1 \\ 0 \\ 2[?][?] \end{bmatrix}, \begin{bmatrix} [?][?]3 \\ 1 \\ [?][?]7[?][?] \end{bmatrix}$

Question **10**

Correct

Marked out of 1.00

One of the following set of vectors are linearly independent

Select one:

- a. $(1,1,2,1,4),(2,-1,2,-1,6),(0,0,0,0,0)$
- b. $x,1,x^2+1$
- c. $(1,2,3),(0,1,0),(0,0,1),(1,1,1)$
- d. $(1,1,2,1,4),(2,2,4,2,8)$

Your answer is correct.

The correct answer is:
$x,1,x^2+1$

Do

Question **11**

Correct

Marked out of 1.00

A basis for the Row space of

$$A=\begin{bmatrix}1 & 2 & 3 & 0 & 1\\ 0 & -1 & 1 & 0 & 0\\ 2 & 3 & 7 & 0 & 2\end{bmatrix}$$

is

Select one:

- a. none
- b. $\begin{bmatrix}1 & 2 & 3 & 0 & 1\end{bmatrix}$, $[[?][?]0\ -1\ 1\ 0\ 0]$ ✔
- c. $\begin{bmatrix}1 & 2 & 3 & 0 & 1\end{bmatrix}$,
  $[[?][?]0\ -1\ 1\ 0\ 0]$,
  $[[?][?]2\ 3\ 7\ 0\ 2]$
- d. $[[?][?]0\ -1\ 1\ 0\ 0]$

Your answer is correct.

The correct answer is: $\begin{bmatrix}1 & 2 & 3 & 0 & 1\end{bmatrix}$, $[[?][?]0\ -1\ 1\ 0\ 0]$

◀ quiz4

Jump to...

Quiz5 ▶

Started on	Saturday, 29 May 2021, 5:00 PM
State	Finished
Completed on	Saturday, 29 May 2021, 5:15 PM
Time taken	14 mins 51 secs
Grade	**5** out of 6 (**83**%)

Question **1**

Correct

Mark 1 out of 1

Let V be a vector space, $v_1, v_2, v_3 \in V$ such that v_1, v_2 are linearly independent, v_2, v_3 are linearly independent, then v_1, v_2, v_3 are linearly independent.

Select one:

- a. False ✔
- b. True

The correct answer is: False

Question **2**

Correct

Mark 1 out of 1

Let $S = \{ \begin{pmatrix} a+b \\ a+b \\ a+b \end{pmatrix} : a, b \in \mathbb{R} \}$. Then dimension of S equals

Select one:

- a. 2
- b. 1 ✔
- c. 0
- d. 3

The correct answer is: 1

Question **3**

Correct

Mark 1 out of 1

If V is a vector space and $\{v_1, v_2, \cdots, v_n\}$ is a spanning set for V and $v_{n+1} \in V$, then the set $\{v_1, v_2, \cdots, v_{n+1}\}$ is

Select one:

- a. not a spanning set.
- b. a spanning set. ✔

The correct answer is: a spanning set.

Question **4**

Correct

Mark 1 out of 1

Every linearly independent set of vectors in $\mathbb{R}^4$ has exactly 4 vectors.

Select one:

- a. True
- b. False ✔

The correct answer is: False

Question **5**

Incorrect

Mark 0 out of 1

Which of the following **is not a basis** for the corresponding space

Select one:

- a. $\{(1,-1)^T, (2,-3)^T\}$; $\mathbb{R}^2$ ✖
- b. $\{(1,-1,-1)^T, (2,-3,0)^T, (-1,0,2)^T\}$; $\mathbb{R}^3$
- c. $\{x, 1-x, 2x+3\}$; P_3
- d. $\{5-x, x\}$; P_2

The correct answer is: $\{x, 1-x, 2x+3\}$; P_3

Question 6

Correct

Mark 1 out of 1

If $\{v_1, v_2, v_3, v_4\}$ forms a spanning set for a vector space V, dim$(V) = 3$, v_4 can be written as a linear combination of v_1, v_2, v_3, then

Select one:

- a. $\{v_1, v_2, v_3\}$ do not form a spanning set for V
- b. $\{v_1, v_2, v_3\}$ is a basis for V
- c. v_1 can be written as a linear combination of v_2, v_3, v_4
- d. $\{v_1, v_2, v_3\}$ are linearly dependent

The correct answer is: $\{v_1, v_2, v_3\}$ is a basis for V

◄ Quiz 4 (6-6-2021)

Jump to...

Short Exam 1 ►

Started on	Sunday, 10 January 2021, 9:45 AM
State	Finished
Completed on	Sunday, 10 January 2021, 10:46 AM
Time taken	1 hour 1 min
Grade	**32.00** out of 32.00 (**100**%)

Question **1**

Correct

Mark 1.00 out of 1.00

The transition matrix from the standard basis $S = \left[e_1 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}, e_2 = \begin{pmatrix} 0 \\ 1 \end{pmatrix}\right]$ to the ordered basis $U = \left[u_1 = \begin{pmatrix} 7 \\ 2 \end{pmatrix}, u_2 = \begin{pmatrix} 3 \\ 1 \end{pmatrix}\right]$ is

Select one:

- a. $T = \begin{pmatrix} 7 & 3 \\ 2 & 1 \end{pmatrix}$
- b. $T = \begin{pmatrix} 7 & -3 \\ -2 & 1 \end{pmatrix}$
- c. $T = \begin{pmatrix} -7 & 3 \\ 2 & -1 \end{pmatrix}$
- d. $T = \begin{pmatrix} 1 & -3 \\ -2 & 7 \end{pmatrix}$ ✔

The correct answer is: $T = \begin{pmatrix} 1 & -3 \\ -2 & 7 \end{pmatrix}$

Question **2**

Correct

Mark 1.00 out of 1.00

Let $S = \{f \in C[-1,1] : f(-1) = f(1)\}$, then S is a subspace of $C[-1,1]$.

Select one:

- a. True ✔
- b. False

The correct answer is: True

Question **3**

Correct

Mark 1.00 out of 1.00

The coordinate vector of $\begin{pmatrix} -3 \\ -2 \\ -5 \end{pmatrix}$ with respect to the ordered basis $[\begin{pmatrix} 1 \\ 1 \\ 1 \end{pmatrix}, \begin{pmatrix} 1 \\ 2 \\ 2 \end{pmatrix}, \begin{pmatrix} 2 \\ 3 \\ 4 \end{pmatrix}]$ is

Select one:

a. $\begin{pmatrix} -1 \\ 4 \\ -3 \end{pmatrix}$ ✔

b. $\begin{pmatrix} 1 \\ 2 \\ 3 \end{pmatrix}$

c. $\begin{pmatrix} 1 \\ -4 \\ 3 \end{pmatrix}$

d. $\begin{pmatrix} 3 \\ 2 \\ 5 \end{pmatrix}$

The correct answer is: $\begin{pmatrix} -1 \\ 4 \\ -3 \end{pmatrix}$

Question **4**

Correct

Mark 1.00 out of 1.00

If $v_1, v_2, \cdots, v_n \in V$, dim$(V) = n$ and $v_1, v_2, \cdots, v_n$ are linearly independent, then Span$(v_1, v_2, \cdots, v_n) = V$, .

Select one:

a. True ✔

b. False

The correct answer is: True

Question **5**

Correct

Mark 1.00 out of 1.00

The coordinate vector of $6 + 8x$ with respect to the basis $[2x, 2]$ is $(4, 3)^T$

Select one:

- a. False
- b. True ✔

The correct answer is: True

Question **6**

Correct

Mark 1.00 out of 1.00

If $f_1, f_2, \cdots, f_n \in C^{n-1}[a, b]$ and $W[f_1, f_2, \cdots, f_n](x_0) \neq 0$ for some $x_0 \in [a, b]$, then $f_1, f_2, \cdots, f_n$ are

Select one:

- a. linearly dependent
- b. form a spanning set for $C^{n-1}[a, b]$
- c. linearly independent. ✔

The correct answer is: linearly independent.

Question **7**

Correct

Mark 1.00 out of 1.00

Let V be a vector space, $v_1, v_2, \ldots v_n \in V$ be linearly independent, then the vectors $v_1, v_2, \ldots v_{n-1}$ are linearly independent.

Select one:

- a. False
- b. True ✔

The correct answer is: True

Question 8

Correct

Mark 1.00 out of 1.00

Let $E = [2 + x, 1 - x, x^2 + 1]$ be an ordered basis for P_3. If $p(x) = 2x^2 + 3x + 3$, then the coordinate vector of $p(x)$ with respect to E is

Select one:

a. $\begin{pmatrix} 1 \\ -1 \\ 2 \end{pmatrix}$ ✔

b. $\begin{pmatrix} 2 \\ -3 \\ 1 \end{pmatrix}$

c. $\begin{pmatrix} 3 \\ 2 \\ -3 \end{pmatrix}$

d. $\begin{pmatrix} -2 \\ -3 \\ 2 \end{pmatrix}$

The correct answer is: $\begin{pmatrix} 1 \\ -1 \\ 2 \end{pmatrix}$

Question 9

Correct

Mark 1.00 out of 1.00

dim$\left(\text{span}(x^2, 3 + x^2, x^2 + 1)\right)$ is

Select one:

a. 3

b. 0

c. 1

d. 2 ✔

The correct answer is: 2

Question **10**

Correct

Mark 1.00 out of 1.00

If $\{v_1, v_2, v_3, v_4\}$ is a basis for a vector space V , then the set $\{v_1, v_2, v_3\}$ is

Select one:

- a. linearly independent and a spanning set for V.
- b. linearly dependent and not a spanning set for V.
- c. linearly independent and not a spanning set for V. ✔
- d. linearly dependent and a spanning set

The correct answer is: linearly independent and not a spanning set for V.

Question **11**

Correct

Mark 1.00 out of 1.00

Which of the following **is not a basis** for the corresponding space

Select one:

- a. $\{5 - x, x - 1\}$; P_2
- b. $\{(-2, -1, -1)^T, (-3, -3, 0)^T, (2, 0, 2)^T\}$; $\mathbb{R}^3$ ✔
- c. $\{(1, 1)^T, (2, -3)^T\}$; $\mathbb{R}^2$
- d. $\{x + 4, 1 - x^2, x^2 + x + 3\}$; P_3

The correct answer is: $\{(-2, -1, -1)^T, (-3, -3, 0)^T, (2, 0, 2)^T\}$; $\mathbb{R}^3$

Question **12**

Correct

Mark 1.00 out of 1.00

If A is a 4×3 matrix such that $N(A) = \{0\}$, and b can be written as a linear combination of the columns of A, then

Select one:

- a. The system $Ax = b$ is inconsistent
- b. The system $Ax = b$ has exactly one solution ✔
- c. The system $Ax = b$ has exactly two solutions
- d. The system $Ax = b$ has infinitely many solutions

The correct answer is: The system $Ax = b$ has exactly one solution

Question **13**

Correct

Mark 1.00 out of 1.00

Every linearly independent set of vectors in $\mathbb{R}^4$ has exactly 4 vectors.

Select one:

- a. True
- b. False ✔

The correct answer is: False

Question **14**

Correct

Mark 1.00 out of 1.00

If the columns of $A_{n \times n}$ are linearly independent and $b \in \mathbb{R}^n$, then the system $Ax = b$ has

Select one:

- a. no solution
- b. infinitely many solutions
- c. exactly 2 solutions
- d. exactly one solution ✔

The correct answer is: exactly one solution

Question **15**

Correct

Mark 1.00 out of 1.00

If A is a 3×3-matrix, and $Ax = 0$ has only the zero solution, then rank$(A) =$

Select one:

- a. 1
- b. 2
- c. 0
- d. 3 ✔

The correct answer is: 3

Question **16**

Correct

Mark 1.00 out of 1.00

If $\{v_1, v_2, v_3, v_4\}$ forms a spanning set for a vector space V, dim$(V) = 3$, v_4 can be written as a linear combination of v_1, v_2, v_3, then

Select one:

- a. $\{v_1, v_2, v_3\}$ is a basis for V ✔
- b. $\{v_1, v_2, v_3\}$ are linearly dependent
- c. v_1 can be written as a linear combination of v_2, v_3, v_4
- d. $\{v_1, v_2, v_3\}$ do not form a spanning set for V

The correct answer is: $\{v_1, v_2, v_3\}$ is a basis for V

Question **17**

Correct

Mark 1.00 out of 1.00

The functions $\sin x, \cos x, \sin(2x)$ in $C^2[0, 2\pi]$ are

Select one:

- a. linearly dependent
- b. linearly independent ✔

The correct answer is: linearly independent

Question **18**

Correct

Mark 1.00 out of 1.00

let A be a 4×7-matrix, if the row echelon form of A has 2 nonzero rows, then dim(column space of A) is

Select one:

- a. 3
- b. 5
- c. 2 ✔
- d. 7

The correct answer is: 2

Question **19**

Correct

Mark 1.00 out of 1.00

Let $E = [2 + x, 3 - x]$, $F = [x, 1]$ be ordered bases for P_2. The transition matrix from E to F is

Select one:

- a. $\begin{pmatrix} 3 & -1 \\ 2 & 1 \end{pmatrix}$
- b. $\begin{pmatrix} 2 & 3 \\ 1 & -1 \end{pmatrix}$
- c. $\begin{pmatrix} 1 & -1 \\ 2 & 3 \end{pmatrix}$ ✔
- d. $\begin{pmatrix} 2 & 3 \\ -1 & 1 \end{pmatrix}$

The correct answer is: $\begin{pmatrix} 1 & -1 \\ 2 & 3 \end{pmatrix}$

Question **20**

Correct

Mark 1.00 out of 1.00

If $T_{n\times n}$ is a transition matrix between two bases for a vector space V, $\dim(V) = n > 0$, then

Select one:

- a. $\det(T) = 1$
- b. T is nonsingular ✔
- c. $\text{nullity}(T) = n$
- d. $\text{rank}(T) = 1$

The correct answer is: T is nonsingular

Question **21**

Correct

Mark 1.00 out of 1.00

The vectors $\{(1, -1, 1)^T, (1, -3, 2)^T, (1, -2, 0)^T\}$ form a basis for $\mathbb{R}^3$.

Select one:

- a. True ✔
- b. False

The correct answer is: True

Question **22**

Correct

Mark 1.00 out of 1.00

The vectors $\{x+1, x^2+x+3, x^2+x+2\}$ form a basis for P_3.

Select one:

- a. True ✔
- b. False

The correct answer is: True

Question **23**

Correct

Mark 1.00 out of 1.00

Let $S = \{\begin{pmatrix} x \\ y \end{pmatrix} \in \mathbb{R}^2 : x - y = 0\}$, then S is a subspace of $\mathbb{R}^2$.

Select one:

- a. False
- b. True ✔

The correct answer is: True

Question **24**

Correct

Mark 1.00 out of 1.00

Every linearly independent set of vectors in $\mathbb{R}^3$ contains at most 3 vectors.

Select one:

- a. True ✔
- b. False

The correct answer is: True

Question **25**

Correct

Mark 1.00 out of 1.00

If $A = \begin{pmatrix} 1 & -2 & 1 & 0 \\ -1 & 2 & 2 & 0 \\ 2 & -1 & 0 & 0 \end{pmatrix}$, then rank$(A) = 3$.

Select one:

- a. False
- b. True ✔

The correct answer is: True

Question **26**

Correct

Mark 1.00 out of 1.00

The rank of $A = \begin{pmatrix} 1 & 4 & 2 & 2 & 1 \\ 2 & 6 & 1 & 2 & -1 \\ 3 & 10 & 0 & 1 & 0 \end{pmatrix}$ is

Select one:

- a. 1
- b. 2
- c. 3 ✔
- d. 4

The correct answer is: 3

Question **27**

Correct

Mark 1.00 out of 1.00

dimension of the subspace $S = \text{Span}\left\{ A_1 = \begin{pmatrix} 1 & 2 \\ 1 & 0 \end{pmatrix}, A_2 \begin{pmatrix} 0 & -1 \\ 1 & 3 \end{pmatrix}, A_3 = \begin{pmatrix} -3 & -8 \\ -1 & 6 \end{pmatrix} \right\}$ is

Select one:

- a. 0
- b. 3
- c. 2 ✔
- d. 1

The correct answer is: 2

Question **28**

Correct

Mark 1.00 out of 1.00

If A, B are two row equivalent $m \times n$-matrices, then rank(A) =rank(B)

Select one:

- a. False
- b. True ✔

The correct answer is: True

Question **29**

Correct

Mark 1.00 out of 1.00

If A is a 3×3-matrix, and $Ax = 0$ has only the zero solution, then nullity(A) $=$

Select one:

- a. 3
- b. 2
- c. 0 ✔
- d. 1

The correct answer is: 0

Question **30**

Correct

Mark 1.00 out of 1.00

Let V be a vector space, $v_1, v_2, v_3 \in V$ such that v_1, v_2 are linearly independent, v_2, v_3 are linearly independent, and v_1, v_3 are linearly independent, then v_1, v_2, v_3 are linearly independent.

Select one:

- a. True
- b. False ✔

The correct answer is: False

Question **31**

Correct

Mark 1.00 out of 1.00

If A is an $m \times n$-matrix, $m \neq n$, then either the rows or the columns of A are linearly independent

Select one:

- a. False ✔
- b. True

The correct answer is: False

Question **32**

Correct

Mark 1.00 out of 1.00

If A is an $n \times n$ singular matrix, then

Select one:

- a. $N(A) = \{0\}$
- b. The columns of A are linearly dependent ✔
- c. The rows of A are linearly independent
- d. rank$(A) = n$

The correct answer is: The columns of A are linearly dependent

Dashboard / My courses / INTRODUCTION TO LINEAR ALGEBRA-Lecture-1202 - MATH234 - 1 / General / Short Exam 1

Started on	Sunday, 11 April 2021, 8:32 AM
State	Finished
Completed on	Sunday, 11 April 2021, 9:01 AM
Time taken	28 mins 31 secs
Grade	**9.00** out of 12.00 (**75**%)

Question **1**

Correct

Mark 1.00 out of 1.00

Let A, B are $n \times n$-matrices with $AB = 0$, if $B \neq 0$, then A is nonsingular.

Select one:

- a. False
- b. True

The correct answer is: False

Question **2**

Correct

Mark 1.00 out of 1.00

Let A be a 3×4 matrix, and let B be a 4×4 matrix which has a column of zeros, then AB has a column of zeros.

Select one:

- a. True
- b. False

The correct answer is: True

Question **3**

Correct

Mark 1.00 out of 1.00

If x_1, x_2 are solutions to $Ax = b$, then $\frac{1}{4}x_1 + \frac{3}{4}x_2$ is a solution of the system $Ax = 0$.

Select one:

- a. True
- b. False ✔

The correct answer is: False

Question **4**

Incorrect

Mark 0.00 out of 1.00

Let $A = \begin{pmatrix} 1 & 2 & 3 & 0 \\ 0 & -1 & 1 & 1 \\ 2 & 5 & 5 & -1 \end{pmatrix}$ and $b = \begin{pmatrix} 2 \\ 1 \\ 4 \end{pmatrix}$. The system $Ax = b$

Select one:

- a. is inconsistent
- b. has a unique solution
- c. has exactly three solutions.
- d. has infinitely many solutions ✘

The correct answer is: is inconsistent

Question **5**

Incorrect

Mark 0.00 out of 1.00

Let $(1, 2, 0)^T$ and $(2, 1, 1)^T$ be the first two columns of a 3×3 matrix A and $(1, 1, 1)^T$ be a solution of the system $Ax = (4, 2, 5)^T$. Then the third column of the matrix A is

Select one:

- a. $(4, -1, 1)^T$.
- b. $(1, 1, 4)^T$. ✘
- c. $(1, -1, -4)^T$.
- d. $(1, -1, 4)^T$.

The correct answer is: $(1, -1, 4)^T$.

Question **6**

Correct

Mark 1.00 out of 1.00

If A is a nonsingular and symmetric matrix, then

Select one:

- a. A^{-1} is singular and not symmetric
- b. A^{-1} is singular and symmetric
- c. A^{-1} is nonsingular and symmetric ✔
- d. A^{-1} is nonsingular and not symmetric

The correct answer is: A^{-1} is nonsingular and symmetric

Question **7**

Correct

Mark 1.00 out of 1.00

If A is a 3×5 matrix, then the system $Ax = 0$

Select one:

- a. has no nonzero solution.
- b. has only the zero solution
- c. is inconsistent
- d. has infinitely many solutions ✔

The correct answer is: has infinitely many solutions

Question **8**

Incorrect

Mark 0.00 out of 1.00

If E is an elementary matrix of type III, then det$(E) = -1$

Select one:

- a. True ✖
- b. False

The correct answer is: False

Question 9
Correct
Mark 1.00 out of 1.00

An $n \times n$ matrix A is invertible if and only if

Select one:

- a. there exists a matrix B such that $AB = I$ ✔
- b. All of the above
- c. $|A| = 0$
- d. $Ax = 0$ has nonzero solutions

The correct answer is: there exists a matrix B such that $AB = I$

Question 10
Correct
Mark 1.00 out of 1.00

If E is an elementary matrix then one of the following statements is not true

Select one:

- a. E is a semmetric matrix. ✔
- b. E^{-1} is an elementary matrix.
- c. E is nonsingular.
- d. E^T is an elementary matrix.

The correct answer is: E is a semmetric matrix.

Question 11
Correct
Mark 1.00 out of 1.00

If $A = LU$ is the LU-factorization of a matrix A, and A is singular, then

Select one:

- a. L and U are both nonsingular
- b. L and U are both singular
- c. L is singular and U is nonsigular
- d. U is singular and L is nonsigular ✔

The correct answer is: U is singular and L is nonsigular

Question **12**

Correct

Mark 1.00 out of 1.00

Let $$A = pmatrix1\&-1\&1 \\ 3\&-2\&2 \\ -2\&1\&3[\backslash\mathtt{end?}]pmatrix$$, then det$(A) =$

Select one:

- a. 0
- b. 8
- c. 4 ✔
- d. 1

The correct answer is: 4

◀ Quiz 3

Jump to...

Quiz 1 (chapter one) ▶

Data retention summary

Started on	Sunday, 11 April 2021, 8:35 AM
State	Finished
Completed on	Sunday, 11 April 2021, 9:05 AM
Time taken	29 mins 19 secs
Grade	**10.00** out of 12.00 (**83**%)

Question **1**

Correct

Mark 1.00 out of 1.00

If $AB = AC$, and $|A| \neq 0$, then

Select one:

a. $B = C$.

b. $A = C$

c. $B \neq C$

The correct answer is: $B = C$.

Question **2**

Correct

Mark 1.00 out of 1.00

If A is an $n \times n$-matrix with positive entries, then det$(A) \geq 0$.

Select one:

a. False

b. True

The correct answer is: False

Question **3**

Correct

Mark 1.00 out of 1.00

If x_1, x_2 are solutions to $Ax = b$, then $x_1 - x_2$ is a solution of the system $Ax = b$.

Select one:

- a. False
- b. True

The correct answer is: False

Question **4**

Correct

Mark 1.00 out of 1.00

An $n \times n$ matrix A is invertible if and only if

Select one:

- a. All of the above
- b. there exists a matrix B such that $AB = I$
- c. $|A| = 0$
- d. $Ax = 0$ has nonzero solutions

The correct answer is: there exists a matrix B such that $AB = I$

Question **5**

Correct

Mark 1.00 out of 1.00

If A is row equivalent to B, then $\det(A) = \det(B)$.

Select one:

- a. False
- b. True

The correct answer is: False

Question **6**

Correct

Mark 1.00 out of 1.00

Let A be an $n \times n$-matrix in reduced row echelon form and $A \neq I$, then

Select one:

- a. A is singular ✔
- b. $\det(A) = 1$
- c. A is the zero matrix
- d. A is nonsingular

The correct answer is: A is singular

Question **7**

Correct

Mark 1.00 out of 1.00

If U is the reduced row echelon form of an $n \times n$ nonsingular matrix, then $U = I_n$.

Select one:

- a. False
- b. True ✔

The correct answer is: True

Question **8**

Correct

Mark 1.00 out of 1.00

If A is singular and B is nonsingular $n \times n$-matrices, then AB is

Select one:

- a. singular ✔
- b. nonsingular
- c. may or may not be singular
- d. none of the above

The correct answer is: singular

Question **9**

Correct

Mark 1.00 out of 1.00

Let $A = \begin{pmatrix} 1 & -1 & 1 \\ 3 & -2 & 2 \\ -2 & 5 & 3 \end{pmatrix}$, then $\det(A) =$

Select one:

- a. 0
- b. 9
- c. 5
- d. 8 ✔

The correct answer is: 8

Question **10**

Incorrect

Mark 0.00 out of 1.00

If $A = \begin{pmatrix} 1 & -2 & 5 \\ 4 & -5 & 8 \\ -3 & 3 & -3 \end{pmatrix}$ and $b = \begin{pmatrix} b_1 \\ b_2 \\ b_3 \end{pmatrix}$, then the system $Ax = b$ is consistent if and only if

Select one:

- a. $b_1 - b_2 - b_3 = 0$
- b. $b_2 - b_1 - b_3 = 0$ ✖
- c. $b_3 + b_1 + b_2 = 0$
- d. $b_3 - b_1 - b_2 = 0$

The correct answer is: $b_1 - b_2 - b_3 = 0$

Question **11**

Incorrect

Mark 0.00 out of 1.00

Let $(1,2,0)^T$ and $(2,1,1)^T$ be the first two columns of a 3×3 matrix A and $(1,1,1)^T$ be a solution of the system $Ax=(4,2,5)^T$. Then the third column of the matrix A is

Select one:

- a. $(1,-1,-4)^T$.
- b. $(4,-1,1)^T$.
- c. $(1,-1,4)^T$.
- d. $(1,1,4)^T$. ✖

The correct answer is: $(1,-1,4)^T$.

Question **12**

Correct

Mark 1.00 out of 1.00

If A is a nonsingular and symmetric matrix, then

Select one:

- a. A^{-1} is nonsingular and symmetric ✔
- b. A^{-1} is nonsingular and not symmetric
- c. A^{-1} is singular and not symmetric
- d. A^{-1} is singular and symmetric

The correct answer is: A^{-1} is nonsingular and symmetric

◄ Quiz 3

Jump to...

Quiz 1 (chapter one) ►

Started on	Sunday, 9 May 2021, 11:36 AM
State	Finished
Completed on	Sunday, 9 May 2021, 12:59 PM
Time taken	1 hour 22 mins
Grade	**30** out of 32 (**94**%)

Question **1**

Correct

Mark 1 out of 1

One of the follwoing sets is a subspace of P_4

Select one:

- a. $S = \{f(x) \in P_4 : f(1) = 0\}$ ✔
- b. $S = \{f(x) \in P_4 : f(1) = 1\}$
- c. $S = \{f(x) \in P_4 : f(0) = 0, \text{and } f'(0) = 2\}$
- d. $S = \{f(x) \in P_4 : f(0) = 1\}$

The correct answer is: $S = \{f(x) \in P_4 : f(1) = 0\}$

Question **2**

Correct

Mark 1 out of 1

Let A be a 3×3-matrix with $a_1 = a_2$. If $b = a_2 - a_3$, where a_1, a_2, a_3 ar the columns of A, then a solution to the system $Ax = b$ is

Select one:

a. $x = \begin{pmatrix} 1 \\ 1 \\ 0 \end{pmatrix}$

b. $x = \begin{pmatrix} 0 \\ 0 \\ 2 \end{pmatrix}$

c. $x = \begin{pmatrix} 1 \\ 1 \\ -1 \end{pmatrix}$

d. $x = \begin{pmatrix} 1 \\ 0 \\ -1 \end{pmatrix}$

The correct answer is: $x = \begin{pmatrix} 1 \\ 0 \\ -1 \end{pmatrix}$

Question **3**

Correct

Mark 1 out of 1

Let $A = \begin{pmatrix} 1 & 1 & 0 \\ 1 & a & 1 \\ 1 & 1 & 2 \end{pmatrix}$. the value(s) of a that make A nonsingular

Select one:

a. $a \neq 1$

b. $a = \frac{1}{2}$

c. $a \neq \frac{1}{2}$

d. $a = 1$

The correct answer is: $a \neq 1$

Question **4**

Correct

Mark 1 out of 1

If the row echelon form of $(A|b)$ is $\begin{pmatrix} 1 & 0 & -2 & -1 & | & -2 \\ 0 & 1 & 1 & -1 & | & -1 \\ 0 & 0 & 1 & 1 & | & 1 \end{pmatrix}$ then the general form of the solutions is given by

Select one:

a. $x = \begin{pmatrix} -2-\alpha \\ -1+2\alpha \\ -\alpha \\ \alpha \end{pmatrix}$

b. $x = \begin{pmatrix} \alpha \\ 2-\alpha \\ \alpha \\ \alpha \end{pmatrix}$

c. $x = \begin{pmatrix} -2-\alpha \\ 1-\alpha \\ \alpha \\ 1 \end{pmatrix}$

d. $x = \begin{pmatrix} -\alpha \\ -2+2\alpha \\ 1-\alpha \\ \alpha \end{pmatrix}$

The correct answer is: $x = \begin{pmatrix} -\alpha \\ -2+2\alpha \\ 1-\alpha \\ \alpha \end{pmatrix}$

Question **5**

Correct

Mark 1 out of 1

If A, B are $n \times n$-skew-symmetric matrices(A is skew symmetric if $A^T = -A$), then $AB + BA$ is symmetric

Select one:

a. False

b. True

The correct answer is: True

Question **6**

Incorrect

Mark 0 out of 1

The vectors $\{x+1, x^2+x+1, x^2+2x+1\}$ form a spanning set for P_3.

Select one:

- a. False ✗
- b. True

The correct answer is: True

Question **7**

Correct

Mark 1 out of 1

If $AB = 0$, where A and B are $n \times n$ nonzero matrices. Then

Select one:

- a. both A, B are singular. ✓
- b. either A or B is nonsingular
- c. both A, B are nonsingular.
- d. either $A = 0$ or $B = 0$

The correct answer is: both A, B are singular.

Question **8**

Correct

Mark 1 out of 1

Let $S = \{\begin{pmatrix} x \\ y \end{pmatrix} \in \mathbb{R}^2 : x + y = 0\}$, then S is a subspace of $\mathbb{R}^2$.

Select one:

- a. True ✓
- b. False

The correct answer is: True

Question 9

Incorrect

Mark 0 out of 1

If A is symmetric and skew symmetric then $A = 0$. (A is skew symmetric if $A = -A^T$).

Select one:

- a. False
- b. True

The correct answer is: True

Question 10

Correct

Mark 1 out of 1

If $(A|b) = \begin{pmatrix} 1 & -1 & -1 & | & 2 \\ -2 & 3 & 1 & | & -1 \\ 1 & 1 & \alpha & | & \beta \end{pmatrix}$, then the system is inconsistent if and only if

Select one:

- a. $\alpha \neq -3$ and β any number
- b. $\alpha = -3$ and $\beta \neq 8$
- c. $\alpha \neq -3$ and $\beta \neq 8$
- d. $\alpha = -3$ and $\beta = 8$

The correct answer is: $\alpha = -3$ and $\beta \neq 8$

Question 11

Correct

Mark 1 out of 1

If A and B are singular matrices, then $A + B$ is also singular.

Select one:

- a. False
- b. True

The correct answer is: False

Question **12**

Correct

Mark 1 out of 1

If A, B are $n \times n$ nonsingular matrices, then $A^2 - B^2 = (A+B)(A-B)$.

Select one:

- a. False
- b. True

The correct answer is: False

Question **13**

Correct

Mark 1 out of 1

If $v_1, v_2, \cdots, v_k$ are vectors in a vector space V, and
Span$(v_1, v_2, \cdots, v_k) =$ Span$(v_1, v_2, \cdots, v_{k-1})$, then v_k can be written as a linear combination of $v_1, v_2, \cdots, v_{k-1}$

Select one:

- a. True
- b. False

The correct answer is: True

Question **14**

Correct

Mark 1 out of 1

If A, B, C are $n \times n$-matrices with A nonsingular and $AB = AC$, then $B = C$

Select one:

- a. False
- b. True

The correct answer is: True

Question **15**

Correct

Mark 1 out of 1

The adjoint of the matrix $\begin{pmatrix} -5 & -2 \\ -4 & -3 \end{pmatrix}$ is

Select one:

- a. $\begin{pmatrix} 5 & -4 \\ -2 & 3 \end{pmatrix}$
- b. $\begin{pmatrix} -3 & 2 \\ 4 & -5 \end{pmatrix}$
- c. $\begin{pmatrix} -5 & 3 \\ 2 & -4 \end{pmatrix}$
- d. $\begin{pmatrix} -4 & -2 \\ -3 & -5 \end{pmatrix}$

The correct answer is: $\begin{pmatrix} -3 & 2 \\ 4 & -5 \end{pmatrix}$

Question **16**

Correct

Mark 1 out of 1

If y, z are solutions to $Ax = b$, then $\frac{1}{4}y + \frac{3}{4}z$ is a solution of the system $Ax = b$.

Select one:

- a. True
- b. False

The correct answer is: True

Question **17**

Correct

Mark 1 out of 1

If A is a 4×4-matrix and $x = \begin{pmatrix} 2 \\ 3 \\ 0 \\ 1 \end{pmatrix}$ is a solution to the system $Ax = 0$, then A is singular.

Select one:

- a. False
- b. True

The correct answer is: True

Question **18**

Correct

Mark 1 out of 1

If $(2A)^{-1} = \begin{pmatrix} 3 & 2 \\ 5 & 4 \end{pmatrix}$, then $A =$

Select one:

- a. $\begin{pmatrix} 1 & \frac{-1}{2} \\ \frac{-5}{4} & \frac{3}{4} \end{pmatrix}$
- b. $\begin{pmatrix} 2 & -1 \\ \frac{-5}{2} & \frac{3}{2} \end{pmatrix}$
- c. $\begin{pmatrix} 4 & -2 \\ -5 & 3 \end{pmatrix}$
- d. $\begin{pmatrix} 8 & -4 \\ -10 & 6 \end{pmatrix}$

The correct answer is: $\begin{pmatrix} 1 & \frac{-1}{2} \\ \frac{-5}{4} & \frac{3}{4} \end{pmatrix}$

Question **19**

Correct

Mark 1 out of 1

Let V be a vector space, $\{v_1, v_2, \ldots, v_n\}$ a spanning set for V, and $v \in V$, then the vectors $\{v_1, v_2, \ldots, v_n, v\}$ form a spanning set for V.

Select one:

- a. False
- b. True

The correct answer is: True

Question **20**

Correct

Mark 1 out of 1

If $AB = AC$, and $|A| \neq 0$, then

Select one:

- a. $B \neq C$
- b. $A = 0$
- c. $B = C$.
- d. $A = C$

The correct answer is: $B = C$.

Question **21**

Correct

Mark 1 out of 1

In the $n \times n$-linear system $Ax = b$, if A is singular and b is a linear combination of the columns of A then the system has

Select one:

- a. exactly two solutions
- b. a unique solution
- c. infinitely many solutions
- d. no solution

The correct answer is: infinitely many solutions

Question 22

Correct

Mark 1 out of 1

If A is a 4×3 matrix such that $N(A) = \{0\}$, and b can be written as a linear combination of the columns of A, then

Select one:

a. The system $Ax = b$ has exactly one solution

b. The system $Ax = b$ is inconsistent

c. The system $Ax = b$ has infinitely many solutions

d. The system $Ax = b$ has exactly two solutions

The correct answer is: The system $Ax = b$ has exactly one solution

Question 23

Correct

Mark 1 out of 1

If E is an elementary matrix then one of the following statements is false

Select one:

a. E^{-1} is an elementary matrix.

b. E is diagonal matrix.

c. E is nonsingular.

d. E^T is an elementary matrix.

The correct answer is: E is diagonal matrix.

Question 24

Correct

Mark 1 out of 1

The vectors $\{(1,-1,1)^T, (1,-2,2)^T, (1,-2,1)^T\}$ form a spanning set for $\mathbb{R}^3$.

Select one:

a. False

b. True

The correct answer is: True

Question **25**

Correct

Mark 1 out of 1

If A is a 3×3 matrix with $\det(A) = -3$. Then $\det(adj(A)) =$

Select one:

- a. $-3.$
- b. $-27.$
- c. $9.$
- d. $-9.$

The correct answer is: $9.$

Question **26**

Correct

Mark 1 out of 1

If A is a singular matrix, then A can be written as a product of elementary matrices.

Select one:

- a. True
- b. False

The correct answer is: False

Question **27**

Correct

Mark 1 out of 1

Let $A = \begin{pmatrix} 1 & -1 & 1 \\ 3 & -2 & 2 \\ -2 & -1 & 3 \end{pmatrix}$, then det$(A) =$

Select one:

- a. 5
- b. 3
- c. 2
- d. 0

The correct answer is: 2

Question **28**

Correct

Mark 1 out of 1

Let $S = \{f \in C[-1,1] : f \text{ is an odd function }\}$, then S is a subspace of $C[-1,1]$.

Select one:

- a. True
- b. False

The correct answer is: True

Question **29**

Correct

Mark 1 out of 1

An $n \times n$ matrix A is singular if and only if

Select one:

- a. there exists a matrix B such that $AB = I$
- b. $A = I$
- c. $Ax = 0$ has only the zero solution
- d. $|A| = 0$

The correct answer is: $|A| = 0$

Question **30**

Correct

Mark 1 out of 1

If A is a singular $n \times n$-matrix, $b \in \mathbb{R}^n$, then the system $Ax = b$

Select one:

- a. has either no solution or an infinite number of solutions
- b. has infinitely many solutions.
- c. has a unique solution
- d. is inconsistent

The correct answer is: has either no solution or an infinite number of solutions

Question **31**

Correct

Mark 1 out of 1

If $(A|b) = \begin{pmatrix} 1 & 1 & 2 & | & 4 \\ 2 & -1 & 2 & | & 6 \\ 0 & 3 & 2 & | & 1 \end{pmatrix}$ is the augmented matrix of the system $Ax = b$ then the system has no solution

Select one:

- a. False
- b. True

The correct answer is: True

Question **32**

Correct

Mark 1 out of 1

Let $(1, 2, 0)^T$ and $(2, 1, 1)^T$ be the first two columns of a 3×3 matrix A and $(1, 1, 1)^T$ be a solution of the system $Ax = (1, 1, -2)^T$. Then the third column of the matrix A is

Select one:

- a. $(1, 2, -1)^T$.
- b. $(-2, -2, -3)^T$.
- c. $(2, 2, 3)^T$.
- d. $(-1, 0, 1)^T$.

The correct answer is: $(-2, -2, -3)^T$.