Dashboard / My courses / INTRODUCTION TO LINEAR ALGEBRA-Lecture-1201-Meta / General / Second Exam

| | |
|---|---|
| **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 $4 \times 3$ 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 $3 \times 5$ 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 $S = \{ \begin{pmatrix} a+b+2c \\ a+2c \\ a+b+2c \end{pmatrix} : a, b \in \mathbb{R}\}$. Then dimension of $S$ equals

Select one:
- a. $3$
- 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 $3\times 5$-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 $5 \times 4$ 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 $4 \times 6$ 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 $4 \times 2$-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 $4 \times 3$ 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