

Form A

Birzeit University  
Department of Mathematics

Quiz 3

Math 234

November 14, 2018

Name:.....key

Number:.....

**Q1 [10 points].** True or False?

- T 1. If  $W$  is a subspace of  $U$  and  $U$  is a subspace of  $V$ , then  $W$  is a subspace of  $V$ .
- F 2. The set of continuous functions  $f = f(x)$  on  $[a, b]$  such that  $\int_a^b f(x) dx = 1$  is a subspace of  $C[a, b]$ .
- F 3. If  $U$  and  $W$  are subspaces of a vector space  $V$ , then  $U \cap W = \emptyset$ .
- T 4. If  $S$  and  $T$  are subspaces of a vector space  $V$ , then  $S \cap T$  is a subspace of  $V$ .
- F 5. The set of vectors  $\{(1, a)^T, (b, 1)^T\}$  is a spanning set for  $\mathbb{R}^2$  if  $ab = 1$ .
- T 6. The set  $S = \{(x, y) : x + y = 0\}$  is a subspace of  $\mathbb{R}^2$ .
- T 7.  $W = \{p(x) \in P_5 : p(x) \text{ is even}\}$  is a subspace of  $P_5$ .
- F 8. The null space of  $A = \begin{bmatrix} 1 & 1 & 1 \\ 1 & 1 & 1 \\ 1 & 1 & 1 \end{bmatrix}$  is  $N(A) = \{(t - r, t, r)^T : t, r \in \mathbb{R}\}$ .
- F 9. If  $A$  is a  $3 \times 3$  matrix such that  $N(A) = \{0\}$ , then  $A$  is singular.
- T 10. If  $\text{Span}\{x_1, x_2, x_3\} = \mathbb{R}^3$ , then  $\text{Span}\{x_1, x_2, x_3, x\} = \mathbb{R}^3$ , for any  $x \in \mathbb{R}^3$ .

Good Luck

**Birzeit University**  
**Department of Mathematics**

*Form B*

**Quiz 3**

**Math 234**

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**Name:**.....*key*.....

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**Q1 [10 points]. True or False?**

- T** 1. If  $W$  is a subspace of  $U$  and  $U$  is a subspace of  $V$ , then  $W$  is a subspace of  $V$ .
- T** 2. The set of continuous functions  $\mathbf{f} = f(x)$  on  $[a, b]$  such that  $\int_a^b f(x)dx = 0$  is a subspace of  $C[a, b]$ .
- T** 3. If  $U$  and  $W$  are subspaces of a vector space  $V$ , then  $U \cap W \neq \emptyset$ .
- F** 4. If  $S$  and  $T$  are subspaces of a vector space  $V$ , then  $S \cup T$  is a subspace of  $V$ .
- T** 5. The set of vectors  $\{(1, a)^T, (b, 1)^T\}$  is a spanning set for  $\mathbb{R}^2$  if  $ab \neq 1$ .
- F** 6. The set  $S = \{(x, y) : xy = 0\}$  is a subspace of  $\mathbb{R}^2$ .
- F** 7.  $W = \{p(x) \in P_5 : \text{degree of } p(x) \text{ is even}\}$  is a subspace of  $P_5$ .
- T** 8. The null space of  $A = \begin{bmatrix} 1 & 1 & 1 \\ 1 & 1 & 1 \\ 1 & 1 & 1 \end{bmatrix}$  is  $N(A) = \{(-t - r, t, r)^T : t, r \in \mathbb{R}\}$ .
- T** 9. If  $A$  is a  $3 \times 3$  matrix such that  $N(A) = \{0\}$ , then  $A$  is nonsingular.
- T** 10. If  $\text{Span}\{x_1, x_2, x_3\} = \mathbb{R}^3$ , then  $\text{Span}\{x_1, x_2, x_3, x\} = \mathbb{R}^3$ , for any  $x \in \mathbb{R}^3$ .

**Good Luck**

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