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NPTEL

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Courses » Engineering Mathematics - I

Announcements Course Ask a Question Progress FAQ

Unit 11 - Week 9 :

Register for Certification exam

Course outline

Assignment 9

The due date for submitting this assignment has passed.
As per our records you have not submitted this assignment.

Due on 2019-04-03, 23:59 IST.

1) *1 point*

Let $S = \{\alpha, \beta, \gamma\}, T = \{\alpha, \beta, \alpha + \beta, \beta + \gamma\}$ be subsets of a real vector space V. Then which of following options hold(s) true?

a. $SPAN(S) = SPAN(T)$
b. $SPAN(S) \neq SPAN(T)$
c. if S spans V, then T spans V
d. if T spans V, then S spans V

- a.
- b.
- c.
- d.

No, the answer is incorrect.
Score: 0

Accepted Answers:
a.
c.
d.

2) *1 point*

Let $\alpha_1, \alpha_2, \alpha_3$ and α_4 are vectors in a real vector space V such that $c_1\alpha_1 + c_2\alpha_2 + c_3\alpha_3 + c_4\alpha_4 = 0$, where c_1, c_2, c_3, c_4 are real numbers with $c_1c_4 \neq 0$. Then which of the following options hold(s) true?

a. $\{\alpha_1, \alpha_2, \alpha_3, \alpha_4\}$ is a linearly independent set
b. $SPAN(\alpha_1, \alpha_2, \alpha_3, \alpha_4) = SPAN(\alpha_2, \alpha_3, \alpha_4)$
c. $SPAN(\alpha_1, \alpha_2, \alpha_3, \alpha_4) = SPAN(\alpha_1, \alpha_2, \alpha_3)$
d. $SPAN(\alpha_2, \alpha_3, \alpha_4) \neq SPAN(\alpha_1, \alpha_2, \alpha_3)$

- a.
- b.
- c.
- d.

No, the answer is incorrect.

Assignment Solution

If $S = \{(k,1,k),\ (0,k,1),\ (1,1,1)\}$ is a basis of $\mathbb{R}^3$, then $k \neq$ ______.

a. 0
b. 1
c. -1
d. -2

- a.
- b.
- c.
- d.

No, the answer is incorrect.
Score: 0

Accepted Answers:
b.

4) *1 point*

Let V be a vector space with a basis $\{\alpha_1, \alpha_2, \dots, \alpha_n\}$. Then $\{\alpha_1 + \alpha_2, \alpha_2 + \alpha_3, \dots, \alpha_n + \alpha_1\}$ is a basis of V if n is ______________.

a. divisible by 4
b. even
c. odd
d. 6

- a.
- b.
- c.
- d.

No, the answer is incorrect.
Score: 0

Accepted Answers:
c.

5) *1 point*

Which of the following options is/are true for a non-singular matrix A of order 4?

a. $\text{Rank}(A^{-1}) = 4$
b. $\text{Rank}(A^3) = 3$
c. $\text{Rank}(2A) = 2$
d. $\text{Rank}(\text{adj}(A)) = 4$

- a.
- b.
- c.
- d.

No, the answer is incorrect.
Score: 0

Accepted Answers:
a.
d.

6) *1 point*

Let $A = \begin{pmatrix} 1 & 1 & 1 & 1 \\ 1 & 2 & -1 & \lambda \\ 5 & 7 & 1 & \lambda^2 \end{pmatrix}, \lambda \in \mathbb{R}$. Then rank of A is 2 if $\lambda =$ ____.

a. $1, 3$
b. $-1, 3$
c. $1, -3$
d. $-1, -3$

- a.
- b.
- c.
- d.

No, the answer is incorrect.
Score: 0

Accepted Answers:
b.

7) ***1 point***

Let S be the set of all 2×2 real symmetric matrices. Then which of the following options is true?

a. dimension of S is 2
b. dimension of S is 3
c. basis of S is $\left\{\begin{pmatrix} 1 & 0 \\ 0 & 1 \end{pmatrix}, \begin{pmatrix} 0 & 1 \\ 1 & 0 \end{pmatrix}\right\}$
d. basis of S is $\left\{\begin{pmatrix} 1 & 0 \\ 0 & 0 \end{pmatrix}, \begin{pmatrix} 0 & 1 \\ 1 & 0 \end{pmatrix}, \begin{pmatrix} 0 & 0 \\ 0 & 1 \end{pmatrix}\right\}$

- a.
- b.
- c.
- d.

No, the answer is incorrect.
Score: 0

Accepted Answers:
b.
d.

8) ***1 point***

The dimension of $S = \{(x, y, z, w) \in \mathbb{R}^4 : x + 2y - z + 3w = 0, -2x + y + 2z + 4w = 0\}$

a. 1
b. 2
c. 3
d. 4

- a.
- b.
- c.
- d.

No, the answer is incorrect.
Score: 0

Accepted Answers:
b.

9) ***1 point***

Let $T: \mathbb{R}^3 \to \mathbb{R}^4$ be defined as $T(x_1, x_2, x_3) = (x_2 + x_3,\ x_3 + x_1,\ x_1 + x_2,\ x_1 + x_2 + x_3), (x_1, x_2, x_3) \in \mathbb{R}^3$. Then which of the following options is/are true?

a. T is a linear transformation
b. $\text{Rank}(T) = 3$
c. $\text{Nullity}(T) = 1$
d. $\text{Rank}(T) + \text{Nullity}(T) = 4$

- a.
- b.
- c.
- d.

No, the answer is incorrect.
Score: 0

Accepted Answers:
a.
b.

10) ***1 point***

Let $T: \mathbb{R}^2 \to \mathbb{R}^3$ be a linear transformation defined in such a way that $T(1,1) = (3,0,1)$ and $T(2,3) = (-1,2,0)$. Then $T(x, y) =$ ____________.

a. $(3x - 2y, 4y, -2x + 3y)$
b. $(-2y, -2x + 2y, 3x - 2y)$
c. $(10x - 7y, -2x + 2y, 3x - 2y)$
d. $(7x - 10y, 2x - 2y, -2x + 3y)$

- a.
- b.
- c.
- d.

No, the answer is incorrect.
Score: 0

Accepted Answers:
c.

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