Assignment 9

The due date for submitting this assignment has passed. Due on 2019-04-03, 23:59 IST.
As per our records you have not submitted this assignment.

1) Let $S = \{a, \beta, \gamma\}, T = \{a, \beta, \alpha + \beta, \beta + \gamma\}$ be subsets of a real vector space $V$. Then which of the 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 $V$

   No, the answer is incorrect.
   Score: 0
   Accepted Answers:
   a. c. d.

2) Let $\alpha_1, \alpha_2, \alpha_3$ and $\alpha_4$ 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. $SPAN(\alpha_2, \alpha_3, \alpha_4) = Span(\alpha_1, \alpha_2, \alpha_3)$

   No, the answer is incorrect.
If $S = \{(k,1,k), (0,k,1), (1,1,1)\}$ is a basis of $\mathbb{R}^3$, then $k \neq _____.

a. 0
d. -2

No, the answer is incorrect.
Score: 0
Accepted Answers: 

Let $V$ be a vector space with a basis $\{a_1, a_2, ..., a_n\}$. Then $\{a_1 + a_2, a_2 + a_3, ..., a_n + a_1\}$ is a basis of $V$ if $n$ is ________.

a. divisible by 4
c. odd
d. 6

No, the answer is incorrect.
Score: 0
Accepted Answers: 

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

a. Rank($A^{-1}$) = 4
d. Rank(adj($A$)) = 4

No, the answer is incorrect.
Score: 0
Accepted Answers: 

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 $\lambda = \ldots$

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

No, the answer is incorrect.
Score: 0
Accepted Answers: 

7)
Let $S$ be the set of all $2 \times 2$ 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 $\left\{ \begin{pmatrix} 1 & 0 \\ 0 & 0 \end{pmatrix}, \begin{pmatrix} 0 & 1 \\ 1 & 0 \end{pmatrix}, \begin{pmatrix} 0 & 0 \\ 0 & 1 \end{pmatrix} \right\}$

No, the answer is incorrect.
Score: 0
Accepted Answers: 

8)
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

No, the answer is incorrect.
Score: 0
Accepted Answers: 

9)
Let $T: \mathbb{R}^3 \rightarrow \mathbb{R}^4$ 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. $\text{Rank}(T) + \text{Nullity}(T) = 4$

No, the answer is incorrect.
Score: 0
Accepted Answers:
a.
d.

10)
Let $T: \mathbb{R}^2 \rightarrow \mathbb{R}^3$ 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. $(7x - 10y, 2x - 2y, -2x + 3y)$

No, the answer is incorrect.
Score: 0
Accepted Answers:
c.