Unit 6 - Week 4

Assignment 4

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

Due on 2020-10-14, 23:59 IST.

Considering the following information for answering the Questions.

(P) : $\{(1,y) : y \in \mathbb{R}\} = \text{The line } x = 1$
(Q) : $\{(1,n) : n \in \mathbb{N}\} = \{(1,1),(1,2),(1,3),\ldots\}$
(R) : $\mathbb{R}^2$
(S) : $\mathbb{R}^3$
(T) : A line in $\mathbb{R}^2$ passing through origin
(U) : A line in $\mathbb{R}^2$ but NOT passing through origin
(V) : A plane in $\mathbb{R}^3$ passing through origin
(W) : Union of X-axis and Y-axis

For the Questions (1) to (4), see the informations given above to get the corresponding sets.

1) The set $\mathbf{e}_1 + \{\alpha \mathbf{e}_2 | \alpha \in \mathbb{R}\}$ equals the set in *1 point*

- (P) but NOT in (U)
- (Q) but NOT in (U)
- (P) and (U)
- (Q) and (U)

No, the answer is incorrect.
Score: 0
Accepted Answers:
(P) and (U)

2) The set $\{\alpha \begin{bmatrix} 1 \\ 2 \end{bmatrix} | \alpha \in \mathbb{R}\} + \{\alpha \begin{bmatrix} 1 \\ 1 \end{bmatrix} | \alpha \in \mathbb{R}\}$ equals *1 point*

- the set in (R) but NOT in (W)
- the set in (R) and (W)
- the set in (W) but NOT in (R)
- Neither the set in (W) nor in (R)

No, the answer is incorrect.
Score: 0
Accepted Answers:
the set in (R) but NOT in (W)

3) The set $\{\mathbf{x} \in \mathbb{R}^2 \mid \mathbf{a}^T\mathbf{x} = 0\}$, where $\mathbf{a} \in \mathbb{R}^2, \mathbf{a} \neq \mathbf{0}$ is fixed, equals the set in *1 point*

- (T) and (W)
- (T) and (Q)
- (T) and (P)
- (T) but NOT in (Q)

No, the answer is incorrect.
Score: 0
Accepted Answers:
(T) but NOT in (Q)

4) The set $\left\{\alpha \begin{bmatrix} 2 \\ 1 \\ 1 \end{bmatrix} | \alpha \in \mathbb{R}\right\} + \left\{\alpha \begin{bmatrix} 1 \\ 1 \\ 0 \end{bmatrix} | \alpha \in \mathbb{R}\right\} + \left\{\alpha \begin{bmatrix} 0 \\ 1 \\ 1 \end{bmatrix} | \alpha \in \mathbb{R}\right\}$ equals *1 point*

- Neither the set in (S) nor in (V)
- the set in (V) but NOT in (S)
- the sets in (S) and (V)
- the set in (S) but NOT in (V)

No, the answer is incorrect.
Score: 0
Accepted Answers:
the set in (S) but NOT in (V)

5) Let L_1 and L_2 be two skewed (non parallel, non-intersecting) lines in$\mathbb{R}^3$. What is $L_1 + L_2$? *1 point*

- Whole of $\mathbb{R}^3$
- A plane in $\mathbb{R}^3$ passing through $\mathbf{0}$
- Empty set
- A plane in $\mathbb{R}^3$ NOT passing through $\mathbf{0}$

No, the answer is incorrect.
Score: 0
Accepted Answers:
A plane in $\mathbb{R}^3$ NOT passing through $\mathbf{0}$

6) Which of the following is subspace of $\mathbb{R}^3$? *1 point*

- $\{(x,y,z) \mid x \geq 0\}$
- $\{(x,y,z) \mid x + y = z\}$
- $\{(x,y,z) \mid x = y^2\}$
- $\{(x,y,z) \mid x + y - z = 1\}$

No, the answer is incorrect.
Score: 0
Accepted Answers:
$\{(x,y,z) \mid x + y = z\}$

7) Let $\mathbb{W} = \mathrm{LS}(\{(1,0,0,-1),\ (0,1,0,1),\ (0,0,1,1)\}$. Then $\mathbb{W}$equals *1 point*

- $W = \{(x,y,z,w) : x - y + z + w = 0\}$
- $W = \{(x,y,z,w) : x - y - z - w = 0\}$
- $W = \{(x,y,z,w) : x + y + z - w = 0\}$
- $W = \{(x,y,z,w) : x - y - z + w = 0\}$

No, the answer is incorrect.
Score: 0
Accepted Answers:
$W = \{(x,y,z,w) : x - y - z + w = 0\}$

8) $\mathbb{W} = \{A \in \mathbb{M}_n(\mathbb{R}) \mid A^T = 2A\}$ is a subspace of $M_n(\mathbb{R})$ *1 point*

- TRUE
- FALSE

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

9) Fix $M \in \mathbb{M}_n(\mathbb{R})$. Then $\mathbb{W} = \mathrm{LS}(I_n, M, M^2, \ldots)$ is *1 point*

- a subspace of $\mathbb{U}$ (see previous question)
- NOT a subspace of $\mathbb{U}$ (see previous question) but of$\mathbb{M}_n(\mathbb{R})$

No, the answer is incorrect.
Score: 0
Accepted Answers:
a subspace of $\mathbb{U}$ (see previous question)

10) The informations below gives a collection of subsets of $\mathbb{R}^2$. *1 point*
(P) : $\{\mathbf{0}\}$
(Q) : Any line passing through $[1 \quad 1]^T$
(R) : Any line passing through $[0 \quad 0]^T$
(S) : $\mathbb{R}^2$
Choose the option that gives the collection of all possible subspaces of $\mathbb{R}^2$

- (P), (Q), (S)
- (P), (R), (S)
- (P), (Q), (R), (S)
- (P), (S)

No, the answer is incorrect.
Score: 0
Accepted Answers:
(P), (R), (S)