

Unit 6 - Week 4

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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) : $\{(1, y) : y \in \mathbb{R}\}$ = The line $x = 1$
 (Q) : $\{(1, n) : n \in \mathbb{N}\} = \{(1, 1), (1, 2), (1, 3), \dots\}$
 (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 $e_1 + \{\alpha e_2 | \alpha \in \mathbb{R}\}$ 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 $\left\{ \alpha \begin{bmatrix} 1 \\ 2 \end{bmatrix} \mid \alpha \in \mathbb{R} \right\} + \left\{ \alpha \begin{bmatrix} 1 \\ 1 \end{bmatrix} \mid \alpha \in \mathbb{R} \right\}$ 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 $\{x \in \mathbb{R}^2 \mid a^T x = 0\}$, where $a \in \mathbb{R}^2, a \neq 0$ 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 $\left\{ \alpha \begin{bmatrix} 2 \\ 1 \\ 1 \end{bmatrix} \mid \alpha \in \mathbb{R} \right\} + \left\{ \alpha \begin{bmatrix} 1 \\ 1 \\ 0 \end{bmatrix} \mid \alpha \in \mathbb{R} \right\} + \left\{ \alpha \begin{bmatrix} 0 \\ 1 \\ 1 \end{bmatrix} \mid \alpha \in \mathbb{R} \right\}$ 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 0
 Empty set
 A plane in \mathbb{R}^3 NOT passing through 0

No, the answer is incorrect.

Score: 0

Accepted Answers:

A plane in \mathbb{R}^3 NOT passing through 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 $W = \text{LS}\{(1, 0, 0, -1), (0, 1, 0, 1), (0, 0, 1, 1)\}$. Then 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) $W = \{A \in M_n(\mathbb{R}) \mid A^T = 2A\}$ is a subspace of $M_n(\mathbb{R})$

1 point

- TRUE
 FALSE

No, the answer is incorrect.

Score: 0

Accepted Answers:

TRUE

9) Fix $M \in M_n(\mathbb{R})$. Then $W = \text{LS}\{I_n, M, M^2, \dots\}$ is

1 point

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

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) : $\{0\}$
 (Q) : Any line passing through $\begin{bmatrix} 1 & 1 \end{bmatrix}^T$
 (R) : Any line passing through $\begin{bmatrix} 0 & 0 \end{bmatrix}^T$
 (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)