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Course outline

How does an NPTEL online course work? ()

Setup Guide ()

Pre Course Material ()

Week 2: Assignment 2

The due date for submitting this assignment has passed.

Due on 2023-08-09, 23:59 IST.

As per our records you have not submitted this assignment.

1) Are the vectors $\begin{bmatrix} -2 \\ 4 \end{bmatrix}, \begin{bmatrix} 7 \\ -2 \end{bmatrix}$ and $\begin{bmatrix} 3 \\ -6 \end{bmatrix}$ linearly independent? *1 point*

- Yes
- No

No, the answer is incorrect.
Score: 0

Accepted Answers:
No

2) Does the set, $S = \{(1,1),(1,2)\}$ spans $\mathbb{R}^2$? ***1 point***

- Yes
- No

No, the answer is incorrect.
Score: 0

Accepted Answers:
Yes

3) Consider the following system of linear equations of the form $Ax = b$: ***1 point***

$$2x - 3y + 6z = 14$$
$$x + y - 2z = -3$$

Which among the following are correct?

- $\begin{bmatrix} 1 \\ -4 \\ 0 \end{bmatrix}$ is a solution to $Ax = b$
- $\begin{bmatrix} 0 \\ 2 \\ 1 \end{bmatrix}$ is a solution to $Ax = b$
- $\begin{bmatrix} 1 \\ -4 \\ 0 \end{bmatrix}$ is a solution to $Ax = 0$
- $\begin{bmatrix} 0 \\ 2 \\ 1 \end{bmatrix}$ is a solution to $Ax = 0$

No, the answer is incorrect.

Score: 0

Accepted Answers:

$\begin{bmatrix} 1 \\ -4 \\ 0 \end{bmatrix}$ *is a solution to* $Ax = b$

$\begin{bmatrix} 0 \\ 2 \\ 1 \end{bmatrix}$ *is a solution to* $Ax = 0$

Consider the following systerm of linear equation:

$x + y + z = -2$
$x + 2y - z = 1$
$2x + ay + bz = 2$

4) Find the conditions on a and b for which the above system has no solution. ***1 point***

- $2a + b - 6 = 0$
- $a \neq 4, 2a + b - 6 = 0$
- $a = 4, b = -2$
- $2a + b - 6 \neq 0$

No, the answer is incorrect.
Score: 0

Accepted Answers:
$a \neq 4, 2a + b - 6 = 0$

5) Find the conditions on a and b for which the above system has a unique solution. ***1 point***

- $2a + b - 6 = 0$
- $a \neq 4, 2a + b - 6 = 0$
- $a = 4, b = -2$
-

$2a + b - 6 \neq 0$

No, the answer is incorrect.
Score: 0

Accepted Answers:
$2a + b - 6 \neq 0$

6) Find the conditions on a and b for which the above system has infite number of solutions. ***1 point***

- $2a + b - 6 = 0$
- $a \neq 4, 2a + b - 6 = 0$
- $a = 4, b = -2$
- $2a + b - 6 \neq 0$

No, the answer is incorrect.
Score: 0

Accepted Answers:
$a = 4, b = -2$

In solving the system $Ax = b$ in the variables x_1, x_2, x_3 and x_4, Gaussian elimination on the Augmented matrix$[A|b]$ led to the following row echelon form

$$\left(\begin{array}{cccc|c} 1 & 0 & 0 & 3 & 2 \\ 0 & 1 & 1 & 2 & 3 \\ 0 & 0 & 0 & 1 & 1/3 \\ 0 & 0 & 0 & 0 & 0 \end{array}\right)$$

7) Identify the number of free variable from the above rwo echelon matrix. ***1 point***

- 0
- 1
- 2

- 3

No, the answer is incorrect.
Score: 0

Accepted Answers:
1

8) Which among the following is correct for the above system $Ax = b$? **1 point**

- It has infinite number of solutions.
- It has a unique solution.
- It has no solution.

No, the answer is incorrect.
Score: 0

Accepted Answers:
It has infinite number of solutions.

9) For what values of a are matrix $A = \begin{bmatrix} a & 1 \\ -2 & a+3 \end{bmatrix}$ not invertible? **1 point**

- $a = 1$
- $a = -2$
- $a = -1$
- $a = 2$

No, the answer is incorrect.
Score: 0

Accepted Answers:
$a = -2$
$a = -1$

10) Which among the following is true for the determinant of a matrix? **1 point**

- The determinant of a diagonal matrix is the product of its diagonal entries.

- [ ] If one row of a matrix is a scalar multiple of another, the determinant is 1.
- [ ] If one row of a matrix is a scalar multiple of another, the determinant is 0.
- [ ] The determinant of a permutation matrix can only be 1.

No, the answer is incorrect.
Score: 0

Accepted Answers:
The determinant of a diagonal matrix is the product of its diagonal entries.
If one row of a matrix is a scalar multiple of another, the determinant is 0.

11) Which among the following are the eigenvalues of matrix **1 point**

$$A = \begin{pmatrix} 5 & 8 & 16 \\ 4 & 1 & 8 \\ -4 & -4 & -11 \end{pmatrix}?$$

- ○ 1, 3, −3
- ○ 1, 3, 3
- ○ −1, 3, 3
- ○ 1, −3, −3

No, the answer is incorrect.
Score: 0

Accepted Answers:
1, −3, −3

12) Find the nullity of $A = \begin{bmatrix} 1 & -3 & -2 & 4 \\ 1 & -3 & 1 & 1 \\ 0 & 0 & 1 & -1 \end{bmatrix}$

No, the answer is incorrect.
Score: 0

Accepted Answers:
(Type: Numeric) 2

1 point

13) *1 point*

Let $A = \begin{bmatrix} -1 \\ 2 \\ 2 \end{bmatrix}$. Suppose the eighen values corresponding to AA^T are a, b and c, then find the value of $ab + bc + ca$.

- 9
- 0
- 81
- 18

No, the answer is incorrect.
Score: 0

Accepted Answers:
0