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Points 100  **Published**

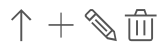
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Questions

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Group 1

Group Name

Pick 1 questions, 5 pts per question Pick questions, pts per question

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Question 1 pts



Which of the following statements is/are correct for matrix $A = \begin{bmatrix} 1 & 2 \\ 2 & 4 \end{bmatrix}$

- ☐ Singular matrix
- ☐ $|A| = 0$
- ☐ Inverse doesn't exist
- ☐ None of the given



Question 1 pts



find the product \mathbf{AB} where $A = \begin{bmatrix} 1 \\ 2 \\ 3 \end{bmatrix}$ and $B = \begin{bmatrix} 4 & 5 & 6 \end{bmatrix}$

☐ $\begin{bmatrix} 4 & 5 & 6 \\ 8 & 10 & 12 \\ 12 & 15 & 18 \end{bmatrix}$

☐
$$\begin{bmatrix} 4 & 5 & 6 \\ 8 & 10 & 12 \\ 12 & 18 & 15 \end{bmatrix}$$

☐ 32

☐ Can not find the product AB


Group 2

 Pick 6 questions, 10 pts per question Pick questions, pts per

question





Question 1 pts



The matrix is $\begin{bmatrix} 1 & 2 & 3 \\ 0 & 3 & 2 \\ 0 & 0 & 1 \end{bmatrix}$ non-singular. Is the statement True or False?

☐ True

☐ False


Question 1 pts



Given four sets of vectors:

$$S1 = \left\{ \begin{bmatrix} 1 \\ 0 \\ 0 \end{bmatrix}, \begin{bmatrix} 0 \\ 1 \\ 0 \end{bmatrix}, \begin{bmatrix} 0 \\ 0 \\ 1 \end{bmatrix} \right\}, S2 = \left\{ \begin{bmatrix} 1 \\ -1 \\ 0 \end{bmatrix}, \begin{bmatrix} 0 \\ 1 \\ -1 \end{bmatrix}, \begin{bmatrix} 0 \\ 0 \\ 1 \end{bmatrix} \right\},$$

$$S3 = \left\{ \begin{bmatrix} 1 \\ -1 \\ 0 \end{bmatrix}, \begin{bmatrix} 0 \\ 1 \\ -1 \end{bmatrix}, \begin{bmatrix} -1 \\ 0 \\ 1 \end{bmatrix} \right\}, \text{ and } S4 = \left\{ \begin{bmatrix} 1 \\ 2 \\ 3 \end{bmatrix}, \begin{bmatrix} -1 \\ -2 \\ -3 \end{bmatrix}, \begin{bmatrix} 2 \\ 4 \\ 6 \end{bmatrix} \right\}.$$

Match the left hand side items with right hand side characteristics.

S1

Set of Linearly independent Vectors

S2

Set of Linearly independent Vectors

S3

Set of Linearly independent Vectors

S4

Set of Linearly dependent Vectors



Question 1 pts



A set of vectors $\{\mathbf{v}_1, \mathbf{v}_2, \dots, \mathbf{v}_n\} \in \mathbb{R}^m$ is said to be **linearly independent** if

the linear combination of the vectors

$$\alpha_1 \mathbf{v}_1 + \alpha_2 \mathbf{v}_2 + \dots + \alpha_n \mathbf{v}_n = \mathbf{0}$$

- ☐ if and only if the real numbers $\alpha_1 = \alpha_2 = \dots = \alpha_n = 0$.

the linear combination of the vectors

$$\alpha_1 \mathbf{v}_1 + \alpha_2 \mathbf{v}_2 + \dots + \alpha_n \mathbf{v}_n = \mathbf{0}$$

- ☐ if there exists real numbers $\alpha_1, \alpha_2, \dots, \alpha_n$, not all equal to zero.

the linear combination of the vectors

$$\alpha_1 \mathbf{v}_1 + \alpha_2 \mathbf{v}_2 + \dots + \alpha_n \mathbf{v}_n = \mathbf{0}$$

- ☐ if there exists real numbers $\alpha_1, \alpha_2, \dots, \alpha_n$, not all equal to zero.



Question 1 pts



The solution of the following system of linear equation
$$\begin{bmatrix} 2 & 1 & -1 \\ -3 & -1 & 2 \\ -2 & 1 & 2 \end{bmatrix} \begin{bmatrix} x \\ y \\ z \end{bmatrix} = \begin{bmatrix} 8 \\ -11 \\ -3 \end{bmatrix}$$
 is

- ☐ $x = 2, y = 3$, and $z = -1$
- ☐ $x = 2, y = 3$, and $z = 1$

☐ $x = 1, y = 3, \text{ and } z = -1$

☐ The system of equations is inconsistent



Question 1 pts



Find the determinant of $A = \begin{bmatrix} 1 & 2 & -3 \\ -1 & 0 & 1 \\ -2 & 2 & 1 \end{bmatrix}$

☐ 2

☐ 1

☐ 0

☐ None of the given



Question 1 pts



Find the inverse of the following matrix if exists.

$A = \begin{bmatrix} 1 & 2 & 3 \\ 3 & 2 & 1 \\ 2 & 4 & 6 \end{bmatrix}$

☐ Singular matrix

☐ Inverse does not exist

☐ Determinant of the system is zero

☐ $\begin{bmatrix} 0 & -10 & -15 \\ -1 & 3 & 3 \\ 1 & 2 & 2 \end{bmatrix}$



Question 1 pts



What is the determinant of the matrix $\begin{bmatrix} -1 & 2 & 2 \\ 3 & -6 & 4 \\ 5 & -10 & -3 \end{bmatrix}$?

☐ 0

- ☐ -10
- ☐ 10
- ☐ None of the given



Question 1 pts



The matrices $\mathbf{A} = \begin{bmatrix} 2 & 3 \\ 1 & 2 \end{bmatrix}$ and $\mathbf{B} = \begin{bmatrix} 2 & -3 \\ -1 & 2 \end{bmatrix}$ are inverse of each other. Is this statement True or False?

- ☐ True
- ☐ False



Group 3

Group Name

Pick 1 questions, 15 pts per question Pick questions, pts per

question



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Question 1 pts



Identify whether the following system is consistent or inconsistent.

$$x + y + z = 3$$

$$2x - y + z = 2$$

$$3y + z = 1$$

- ☐ Inconsistent
- ☐ Consistent
- ☐ Can not determine



Question 1 pts



Find the equation having g , h , and k that makes the following augmented matrix correspond to a consistent system

$$\left[\begin{array}{ccc|c} 1 & -4 & 7 & g \\ 0 & 3 & -5 & h \\ -2 & 5 & -9 & k \end{array} \right]$$

- ☐ $h + 2g + k = 0$
- ☐ $h + 2g + k \neq 0$
- ☐ $h + g + k = 0$
- ☐ None of the given



Group 4

Group Name

Pick 1 questions, 20 pts per question Pick

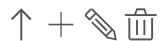


questions,



pts per

question



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Question 1 pts



Which of the following statements is/are true for the given system?

$$x + 3y = 2$$

$$3x + hy = k$$

- ☐ It has an unique solution when $h \neq 9$
- ☐ No solution when $h = 9$ and $k \neq 6$
- ☐ Many solutions when $h = 9$ and $k = 6$
- ☐ None of the given



Question 1 pts



Find the inverse of $B = \begin{bmatrix} 1 & 1 & 0 \\ 1 & 2 & 1 \\ 2 & 3 & 2 \end{bmatrix}$

☐ $\begin{bmatrix} 1 & -2 & 1 \\ 0 & 2 & -1 \\ -1 & -1 & 1 \end{bmatrix}$

☐ $\begin{bmatrix} 1 & 2 & 1 \\ 0 & 2 & -1 \\ -1 & -1 & 1 \end{bmatrix}$

☐ $\begin{bmatrix} 1 & -2 & 1 \\ 0 & 2 & -1 \\ -1 & -1 & 0 \end{bmatrix}$

☐ None of the given



Question 1 pts



What is the inverse of the matrix $\mathbf{B} = \begin{bmatrix} 1 & 3 & 3 \\ 1 & 4 & 3 \\ 1 & 3 & 4 \end{bmatrix}$?

☐ $\begin{bmatrix} 7 & -3 & -3 \\ -1 & 1 & 0 \\ -1 & 0 & 1 \end{bmatrix}$

☐ $\begin{bmatrix} 7 & -3 & -3 \\ 1 & -1 & 0 \\ -1 & 0 & 1 \end{bmatrix}$

☐ $\begin{bmatrix} 7 & 3 & 3 \\ -1 & 1 & 0 \\ -1 & 0 & 1 \end{bmatrix}$

☐ None of the given

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