Linear Algebra

Practice Quiz, 5 questions

1 point

1.

Let two matrices be

$$A = \begin{bmatrix} 4 & 3 \\ 6 & 9 \end{bmatrix}, \qquad B = \begin{bmatrix} -2 & 9 \\ -5 & 2 \end{bmatrix}$$

What is A - B?

- $\begin{bmatrix} 4 & 12 \\ 1 & 11 \end{bmatrix}$
- $\begin{bmatrix} 2 & -6 \\ 1 & 7 \end{bmatrix}$
- $\begin{bmatrix} 6 & -12 \\ 11 & 11 \end{bmatrix}$
- $\begin{bmatrix} 6 & -6 \\ 11 & 7 \end{bmatrix}$

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1 point

2.

Let $x = \begin{bmatrix} 2 \\ 7 \\ 4 \\ 1 \end{bmatrix}$

What is $3 * x$?

- $\begin{bmatrix} \frac{2}{3} & \frac{7}{3} & \frac{4}{3} & \frac{1}{3} \end{bmatrix}$
- $\begin{bmatrix} 6 \\ 21 \\ 12 \\ 3 \end{bmatrix}$
- $\begin{bmatrix} 6 & 21 & 12 & 3 \end{bmatrix}$
- $\begin{bmatrix} \frac{2}{3} \\ \frac{7}{3} \\ \frac{4}{3} \\ \frac{1}{3} \end{bmatrix}$

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1 point

3.

Let u be a 3-dimensional vector, where specifically

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$$u = \begin{bmatrix} 3 \\ 5 \\ 1 \end{bmatrix}$$

What is u^{T}?

- $\begin{bmatrix} 1 & 5 & 3 \end{bmatrix}$
- $\begin{bmatrix} 3 & 5 & 1 \end{bmatrix}$
- $\begin{bmatrix} 1 \\ 5 \\ 3 \end{bmatrix}$
- $\begin{bmatrix} 3 \\ 5 \\ 1 \end{bmatrix}$

1 point

Let u and v be 3-dimensional vectors, where specifically

$$u = \begin{bmatrix} -3 \\ 4 \\ 3 \end{bmatrix}$$

and

$$v = \begin{bmatrix} 3 \\ 1 \\ 5 \end{bmatrix}$$

What is $u^T v$?

(Hint: u^T is a

1x3 dimensional matrix, and v can also be seen as a 3x1

matrix. The answer you want can be obtained by taking

4. the matrix product of u^T and v.) Do not add brackets to your answer.

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1 point

5.
Let A and B be 3x3 (square) matrices. Which of the following

must necessarily hold true? Check all that apply.

- [ ] If $C = A * B$, then C is a 6x6 matrix.
- [x] $A + B = B + A$
- [ ] $A * B * A = B * A * B$
- [x] If v is a 3 dimensional vector, then $A * B * v$ is a 3 dimensional vector.