Linear Algebra

5 questions

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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?

- $\begin{bmatrix} 2 & 12 \\ 1 & 11 \end{bmatrix}$
- $\begin{bmatrix} 6 & -6 \\ 11 & 7 \end{bmatrix}$
- $\begin{bmatrix} 6 & 12 \\ 11 & 11 \end{bmatrix}$
- $\begin{bmatrix} 2 & 9 \\ 1 & 2 \end{bmatrix}$

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2.

Let $x = \begin{bmatrix} 8 \\ 2 \\ 5 \\ 1 \end{bmatrix}$

What is $2 * x$?

- $\begin{bmatrix} 4 & 1 & \frac{5}{2} & \frac{1}{2} \end{bmatrix}$
- $\begin{bmatrix} 16 \\ 4 \\ 10 \\ 2 \end{bmatrix}$
- $\begin{bmatrix} 16 & 4 & 10 & 2 \end{bmatrix}$
- $\begin{bmatrix} 4 \\ 1 \\ \frac{5}{2} \\ \frac{1}{2} \end{bmatrix}$

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3.

Let u be a 3-dimensional vector, where specifically

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

What is u^{T}?

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

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

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

and

$$v = \begin{bmatrix} 2 \\ 2 \\ 4 \end{bmatrix}$$

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.

Enter answer here

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5.

Let A and B be 3x3 (square) matrices. Which of the following must necessarily hold true? Check all that apply.

- [ ] If B is the 3x3 identity matrix, then $A * B = B * A$
- [ ] $A * B = B * A$
- [ ] If $C = A * B$, then C is a 3x3 matrix.
- [ ] $A * B * A = B * A * B$

4 questions unanswered

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