

1. Let two matrices be 1 point

$$A = \begin{bmatrix} 1 & -4 \\ -2 & 1 \end{bmatrix}, \quad B = \begin{bmatrix} 0 & 3 \\ 5 & 8 \end{bmatrix}$$

What is A - B?

- ☐ $\begin{bmatrix} 1 & 1 \\ -3 & -7 \end{bmatrix}$
- ☒ $\begin{bmatrix} 1 & -7 \\ -7 & -7 \end{bmatrix}$
- ☐ $\begin{bmatrix} 1 & 7 \\ 7 & 9 \end{bmatrix}$
- ☐ $\begin{bmatrix} 1 & -7 \\ -7 & 7 \end{bmatrix}$

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

What is $2 * x$?

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

3. Let u be a 3-dimensional vector, where specifically 1 point

$$u = \begin{bmatrix} 8 \\ 1 \\ 4 \end{bmatrix}$$

What is u^T ?

- ☐ $\begin{bmatrix} 4 \\ 1 \\ 8 \end{bmatrix}$
- ☐ $\begin{bmatrix} 4 & 1 & 8 \end{bmatrix}$
- ☐ $\begin{bmatrix} 8 \\ 1 \\ 4 \end{bmatrix}$
- ☒ $\begin{bmatrix} 8 & 1 & 4 \end{bmatrix}$

4. Let u and v be 3-dimensional vectors, where specifically 1 point

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

and

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

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

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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. 1 point

- ☒ If A is the 3x3 identity matrix, then $A * B = B * A$
- ☐ If $C = A * B$, then C is a 6x6 matrix.
- ☒ $A + B = B + A$
- ☐ $A * B = B * A$