Congratulations! You passed!

TO PASS 80% or higher

Keep Learning

GRADE 100%

Linear Algebra

TOTAL POINTS 5

1. Let two matrices be

1 / 1 point

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

What is A - B?

- $\begin{bmatrix} 1 & 7 \\ 7 & 9 \end{bmatrix}$
- $\begin{bmatrix} 1 & 1 \\ -3 & -7 \end{bmatrix}$
- $\begin{bmatrix} 1 & -7 \\ -7 & 7 \end{bmatrix}$
- (selected) $\begin{bmatrix} 1 & -7 \\ -7 & -7 \end{bmatrix}$

Correct

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

1 / 1 point

What is $3 * x$?

- (selected) $\begin{bmatrix} 6 \\ 21 \\ 12 \\ 3 \end{bmatrix}$
- $\begin{bmatrix} 6 & 21 & 12 & 3 \end{bmatrix}$
- $\begin{bmatrix} \frac{2}{3} & \frac{7}{3} & \frac{4}{3} & \frac{1}{3} \end{bmatrix}$
- $\begin{bmatrix} \text{undefined} \\ \text{undefined} \\ \text{undefined} \\ \text{undefined} \end{bmatrix}$

Correct

To multiply the vector x by 3, take each element of x and multiply that element by 3.

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

1 / 1 point

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

What is u^T?

- $\begin{bmatrix} 4 & 1 & 8 \end{bmatrix}$
- $\begin{bmatrix} 8 \\ 1 \\ 4 \end{bmatrix}$
- $\begin{bmatrix} 4 \\ 1 \\ 8 \end{bmatrix}$
- (selected) $\begin{bmatrix} 8 & 1 & 4 \end{bmatrix}$

Correct

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

1 / 1 point

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

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

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

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Correct

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

1 / 1 point

must necessarily hold true? Check all that apply.

- [ ] If $C = A * B$, then C is a 6x6 matrix.
- [x] If A is the 3x3 identity matrix, then $A * B = B * A$

Correct

Even though matrix multiplication is not commutative in general ($A * B \neq B * A$ for general matrices A, B), for the special case where $A = I$, we have $A * B = I * B = B$, and also $B * A = B * I = B$. So, $A * B = B * A$.

- [x] $A + B = B + A$

Correct

We add matrices element-wise. So, this must be true.

- [ ] $A * B = B * A$