



✓ **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

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

What is $A + B$?

☐ $\begin{bmatrix} 2 & 9 \\ 1 & 2 \end{bmatrix}$

☒ $\begin{bmatrix} 2 & 12 \\ 1 & 11 \end{bmatrix}$

☐ $\begin{bmatrix} 6 & -6 \\ 11 & 7 \end{bmatrix}$

☐ $\begin{bmatrix} 6 & 12 \\ 11 & 11 \end{bmatrix}$

✓ Correct

To add two matrices, add them element-wise.

2.

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

1 / 1 point

What is $3 * x$?

☐ $\begin{bmatrix} \frac{2}{3} & \frac{7}{3} & \frac{4}{3} & \frac{1}{3} \end{bmatrix}$

☐ $\begin{bmatrix} 6 & 21 & 12 & 3 \end{bmatrix}$

☐ $\begin{bmatrix} \frac{2}{3} \\ \frac{7}{3} \\ \frac{4}{3} \\ \frac{1}{3} \end{bmatrix}$

☒ $\begin{bmatrix} 6 \\ 21 \\ 12 \\ 3 \end{bmatrix}$

✓ 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

$$u = \begin{bmatrix} 2 \\ 1 \\ 8 \end{bmatrix}$$

What is u^T ?

☐ $\begin{bmatrix} 8 \\ 1 \\ 2 \end{bmatrix}$

☒ $\begin{bmatrix} 2 & 1 & 8 \end{bmatrix}$

☐ $\begin{bmatrix} 8 & 1 & 2 \end{bmatrix}$

☐ $\begin{bmatrix} 2 \\ 1 \\ 8 \end{bmatrix}$

✓ Correct

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

1 / 1 point

$$\begin{bmatrix} 3 \end{bmatrix}$$

$$u = \begin{bmatrix} -5 \\ 4 \end{bmatrix}$$

and

$$v = \begin{bmatrix} 1 \\ 2 \\ 5 \end{bmatrix}$$

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 must necessarily hold true? Check all that apply.

1 / 1 point

☐ $A * B * A = B * A * B$

☒ If $C = A * B$, then C is a 3x3 matrix.

✓ Correct

Since A and B are both 3x3 matrices, their product is 3x3. More generally, if A were an $m \times n$ matrix, and B a $n \times o$ matrix, then C would be $m \times o$. (In our example, $m = n = o = 3$.)

☒ If B 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 $B = I$, we have $A * B = A * I = A$, and also $B * A = I * A = A$. So, $A * B = B * A$.

☐ $A * B = B * A$