Linear Algebra
Practice Quiz, 5 questions

5/5 points (100%)

✓ **Congratulations! You passed!**

✓ 1 / 1
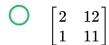point

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?

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

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

Correct
To add two matrices, add them element-wise.

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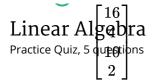
○ $\begin{bmatrix} 2 & 9 \\ 1 & 2 \end{bmatrix}$

✓ 1 / 1
point

2.

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

What is $2 * x$?

○

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$$\begin{bmatrix} 16 \\ 4 \\ 10 \\ 2 \end{bmatrix}$$

▲

Correct

To multiply the vector x by 2, take each element of x and multiply that element by 2.

○ $\begin{bmatrix} 4 \\ 1 \\ \frac{5}{2} \\ \frac{1}{2} \end{bmatrix}$

○ $\begin{bmatrix} 4 & 1 & \frac{5}{2} & \frac{1}{2} \end{bmatrix}$

○ $\begin{bmatrix} 16 & 4 & 10 & 2 \end{bmatrix}$

✔   1 / 1
     point

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

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

What is u^{T}?

○ $\begin{bmatrix} 4 & 1 & 8 \end{bmatrix}$

◉ $\begin{bmatrix} 8 & 1 & 4 \end{bmatrix}$

▲

Correct

○ $\begin{bmatrix} 8 \\ 1 \\ 4 \end{bmatrix}$

○ $\begin{bmatrix} 4 \\ 1 \\ 8 \end{bmatrix}$

✔   1 / 1
     point

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

5/5 points (100%)

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

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.
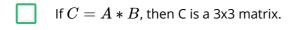
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Correct Response

✔ 1 / 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 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, $m = n = o = 3$.)

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☐ 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, $A * B = B * A$.

☐ $A * B * A = B * A * B$

Un-selected is correct

☐ $A * B = B * A$

Un-selected is correct

☐

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, $A * B = B * A$.