

Linear Algebra

Practice Quiz, 5 questions

✓ **Congratulations! You passed!**

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1. Let two matrices be

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

What is $A + B$?

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

Correct

To add two matrices, add them element-wise.

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

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

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



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

What is $2 * x$?

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

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



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



Correct

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



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



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

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

What is u^T ?



$$[8 \quad 1 \quad 4]$$



Correct



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



$$[4 \quad 1 \quad 8]$$



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



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

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$$u = \begin{bmatrix} 3 \\ -5 \\ 4 \end{bmatrix}$$

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 Response



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

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must necessarily hold true? Check all that apply.



If v is a 3 dimensional vector, then $A * B * v$ is a 3 dimensional vector.

Correct

Since A and B are both 3x3 matrices, $A * B$ is 3x3 matrix. Thus, $(A * B) * v$ is a 3x3 matrix times a 3×1 matrix (since v is a 3 dimensional

vector, and thus also a 3×1 matrix), and the result gives a 3×1 vector.

☐ If $C = A * B$, then C is a 6×6 matrix.



Un-selected is correct

☒ $A + B = B + A$



Correct

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

☐ $A * B * A = B * A * B$



Un-selected is correct

