Linear Algebra
Practice Quiz, 5 questions

✔ **Congratulations! You passed!**

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1.
Let two matrices be

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

What is A - B?

○ $\begin{bmatrix} 1 & -7 \\ -7 & -7 \end{bmatrix}$

Correct

○ $\begin{bmatrix} 1 & 1 \\ -3 & -7 \end{bmatrix}$

○ $\begin{bmatrix} 1 & 7 \\ 7 & 9 \end{bmatrix}$

○ $\begin{bmatrix} 1 & -7 \\ -7 & 7 \end{bmatrix}$

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2.

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Let $x = \begin{bmatrix} 2 \\ 8 \\ 4 \\ 1 \end{bmatrix}$

What is $\frac{1}{2} * x$?

○ $\begin{bmatrix} 1 \\ \frac{7}{2} \\ 2 \\ \frac{1}{2} \end{bmatrix}$

▲

Correct

To multiply the vector x by $\frac{1}{2}$, take each element of x and multiply that element by $\frac{1}{2}$.

○ $\begin{bmatrix} 1 & \frac{7}{2} & 2 & \frac{1}{2} \end{bmatrix}$

○ $\begin{bmatrix} 4 & 14 & 8 & 2 \end{bmatrix}$

○ $\begin{bmatrix} 4 \\ 14 \\ 8 \\ 2 \end{bmatrix}$

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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}?

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

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

▲

Correct

○

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$$\begin{bmatrix} 4 \\ 5 \\ 8 \end{bmatrix}$$

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

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4.

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

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

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

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5.
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must necessarily hold true? Check all that apply.

☐ If $C = A * B$, then C is a 6x6 matrix.

▲

Un-selected is correct

☐ $A * B = B * A$

▲

Un-selected is correct

☐ 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, $A * B = B * A$.

☐ $A + B = B + A$

▲

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