

✔

Congratulations! You passed!

Go to next item

Linear Algebra

Total points 5

1. Let two matrices be

1 / 1 point

- ☒ $\begin{bmatrix} 6 & -6 \\ 11 & 7 \end{bmatrix}$
- ☐ $\begin{bmatrix} 4 & 12 \\ 1 & 11 \end{bmatrix}$

- ☐ $\begin{bmatrix} 2 & -6 \\ 1 & 7 \end{bmatrix}$

✔ Correct

To subtract B from A, carry out the subtraction element-wise.

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

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

1 / 1 point

- ☐ $\begin{bmatrix} 4 & 14 & 8 & 2 \end{bmatrix}$
- ☒ $\begin{bmatrix} 1 \\ 7 \\ 2 \\ 2 \\ 1 \\ 2 \end{bmatrix}$

✔ Correct

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

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

1 / 1 point

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

What is u^T ?

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

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

- ☐ $\begin{bmatrix} 4 & 1 & 8 \end{bmatrix}$

✔ Correct

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

1 / 1 point

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

and

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

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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.

✔ Correct

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

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

☒ 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 3x1 matrix), and the result gives a 3x1 vector.

☐ $A * B * A = B * A * B$