Feedback — III. Linear Algebra

Help

You submitted this quiz on Mon 30 Jun 2014 4:21 PM PDT. You got a score of 5.00 out of **5.00**.

Explanation

Question 1

Let two matrices be

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

$$B = \begin{bmatrix} -2 & 9 \\ -5 & 2 \end{bmatrix}$$

Score

What is A + B?

| _ | _ |
|---|----|
| 6 | 12 |

Your Answer

 $\begin{vmatrix} 0 & 12 \\ 11 & 11 \end{vmatrix}$

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

- 11
- 1.00

To add two matrices, add them element-wise.

Total

1.00 / 1.00

Question 2

Let
$$x = egin{bmatrix} 5 \ 5 \ 2 \ 7 \end{bmatrix}$$

What is 2 * x?

| Your Answer | Score | Explanation |
|--|-------|---|
| $ \begin{bmatrix} 10 \\ 10 \\ 4 \\ 14 \end{bmatrix} $ | 1.00 | To multiply the vector x by 2, take each element of x and multiply that element by 2. |
| $ \begin{bmatrix} \frac{5}{2} \\ \frac{5}{2} \\ 1 \\ \frac{7}{2} \end{bmatrix} $ | | |
| [10 10 4 14] | | |
| $\begin{bmatrix} \frac{5}{2} & \frac{5}{2} & 1 & \frac{7}{2} \end{bmatrix}$ | | |

Question 3

Let u be a 3-dimensional vector, where specifically

1.00 /

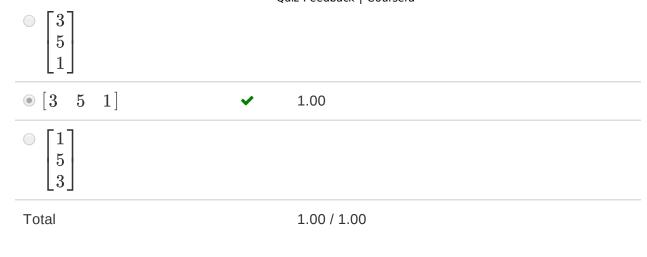
1.00

$$u = \begin{bmatrix} 3 \\ 5 \\ 1 \end{bmatrix}$$

Total

What is u^{T} ?

| Your Answer | Score | Explanation |
|-------------|-------|-------------|
| ○ [1 5 3] | | |



Question 4

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

$$u=\left[egin{array}{c} 3 \ -5 \ 4 \end{array}
ight]$$
 and $v=\left[egin{array}{c} 1 \ 2 \ 5 \end{array}
ight]$

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.)

You entered:

13

| Your Answer | | Score | Explanation |
|-------------|----------|-------------|-------------|
| 13 | ~ | 1.00 | |
| Total | | 1.00 / 1.00 | |

Question 5

Let A and B be 3x3 (square) matrices. Which of the following must necessarily hold true?

| Your Answer | S | Score | Explanation |
|---|------------|----------------|---|
| (A*B)*A = A*(B*A) | ✓ 0 |).25 | This true by the associative property of matrix multiplication. More generally, $(A*B)*C=A*(B*C)\text{, and here we have just set }C=A.$ |
| | ✓ C |).25 | We saw in the lecture that matrix multiplication is not commutative in general. |
| $\hfill \hfill C = A * B$, then C is a 6x6 matrix. | ✓ 0 |).25 | 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, $m=n=o=3$.) |
| A + B = B + A | ✓ 0 |).25 | We add matrices element-wise. So, this must be true. |
| Total | | L.00 / L.00 | |