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**.

Question 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?

Your Answer		Score	Explanation
$\begin{bmatrix} 6 & 12 \\ 11 & 11 \end{bmatrix}$			
$\begin{bmatrix} 6 & -6 \\ 11 & 7 \end{bmatrix}$			
$\begin{bmatrix} 2 & 12 \\ 1 & 11 \end{bmatrix}$	✔	1.00	To add two matrices, add them element-wise.
$\begin{bmatrix} 2 & 9 \\ 1 & 2 \end{bmatrix}$			
Total		1.00 / 1.00	

Question 2

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

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.
○ $\begin{bmatrix}\frac{5}{2}\\\frac{5}{2}\\1\\\frac{7}{2}\end{bmatrix}$			
○ $\begin{bmatrix}10 & 10 & 4 & 14\end{bmatrix}$			
○ $\begin{bmatrix}\frac{5}{2} & \frac{5}{2} & 1 & \frac{7}{2}\end{bmatrix}$			
Total		1.00 / 1.00	

Question 3

Let u be a 3-dimensional vector, where specifically

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

What is u^{T}?

Your Answer	Score	Explanation
○ $\begin{bmatrix}1 & 5 & 3\end{bmatrix}$		

$\begin{bmatrix} 3 \\ 5 \\ 1 \end{bmatrix}$		
$\begin{bmatrix} 3 & 5 & 1 \end{bmatrix}$	✔	1.00
$\begin{bmatrix} 1 \\ 5 \\ 3 \end{bmatrix}$		
Total		1.00 / 1.00

Question 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.)

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		Score	Explanation
☑ $(A * B) * A = A * (B * A)$	✔	0.25	This true by the associative property of matrix multiplication. More generally, $(A * B) * C = A * (B * C)$, and here we have just set $C = A$.
☐ $A * B = B * A$	✔	0.25	We saw in the lecture that matrix multiplication is not commutative in general.
☐ If $C = A * B$, 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		1.00 / 1.00	