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Linear Algebra

Practice Quiz, 5 questions

**4/5 points (80%)**

**Congratulations! You passed!**

Next Item

Question Responses

1. Question 1
2. Question 2
3. Question 3
4. Question 4
5. Question 5

Review Materials

1. [**Matrix Multiplication Properties**](https://www.coursera.org/learn/machine-learning/lecture/W1LNU/matrix-multiplication-properties)
2. [**Inverse and Transpose**](https://www.coursera.org/learn/machine-learning/lecture/FuSWY/inverse-and-transpose)
3. [**Matrix Matrix Multiplication**](https://www.coursera.org/learn/machine-learning/lecture/dpF1j/matrix-matrix-multiplication)
4. [**Addition and Scalar Multiplication**](https://www.coursera.org/learn/machine-learning/lecture/R4hiJ/addition-and-scalar-multiplication)
5. [**Matrix Vector Multiplication**](https://www.coursera.org/learn/machine-learning/lecture/aQDta/matrix-vector-multiplication)

Correct

1 / 1 points

Concepts

1. Compute the result of adding two matrices together
   1. [**Addition and Scalar Multiplication (00:11)**](https://www.coursera.org/learn/machine-learning/lecture/R4hiJ/addition-and-scalar-multiplication?t=11)

1.

Let two matrices be

*A*=[1−2−41],*B*=[0538]

What is A + B?



[17−19]



[1−7−7−7]



[13−19]

**Correct**

To add two matrices, add them element-wise.



[1779]

Correct

1 / 1 points

Concepts

1. Compute the result of multiplying a matrix by a scalar number
   1. [**Addition and Scalar Multiplication (01:54)**](https://www.coursera.org/learn/machine-learning/lecture/R4hiJ/addition-and-scalar-multiplication?t=114)

2.

Let *x*=⎡⎣⎢⎢2741⎤⎦⎥⎥

What is 3∗*x*?



[621123]



[23734313]



⎡⎣⎢⎢621123⎤⎦⎥⎥

**Correct**

To multiply the vector x by 3, take each element of x and multiply that element by 3.



⎡⎣⎢⎢⎢⎢⎢⎢23734313⎤⎦⎥⎥⎥⎥⎥⎥

Correct

1 / 1 points

Concepts

1. Compute the transpose of a matrix
   1. [**Inverse and Transpose (07:34)**](https://www.coursera.org/learn/machine-learning/lecture/FuSWY/inverse-and-transpose?t=454)

3.

Let u be a 3-dimensional vector, where specifically

*u*=⎡⎣351⎤⎦

What is *u*T?



⎡⎣351⎤⎦



⎡⎣153⎤⎦



[351]

**Correct**



[153]

Correct

1 / 1 points

Concepts

1. Compute the result of multiplying a matrix by a vector
   1. [**Matrix Vector Multiplication (00:13)**](https://www.coursera.org/learn/machine-learning/lecture/aQDta/matrix-vector-multiplication?t=13)

4.

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

*u*=⎡⎣−343⎤⎦

and

*v*=⎡⎣315⎤⎦

What is *uTv*?

(Hint: *uT* 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 *uT* and *v*.) Do not add brackets to your answer.



**Correct Response**

Incorrect

0 / 1 points

Concepts

1. Compute the result of multiplying a matrix by a matrix
   1. [**Matrix Matrix Multiplication (00:28)**](https://www.coursera.org/learn/machine-learning/lecture/dpF1j/matrix-matrix-multiplication?t=28)
2. Define the identity matrix
   1. [**Matrix Multiplication Properties (04:50)**](https://www.coursera.org/learn/machine-learning/lecture/W1LNU/matrix-multiplication-properties?t=290)

5.

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

must necessarily hold true? Check all that apply.



If B is the 3x3 identity matrix, then *A*∗*B*=*B*∗*A*

**Correct**

Even though matrix multiplication is not commutative in general (*A*∗*B*≠*B*∗*A* for general matrices *A*,*B*), for the special case where *B*=*I*, we have *A*∗*B*=*A*∗*I*=*A*, and also *B*∗*A*=*I*∗*A*=*A*. So, *A*∗*B*=*B*∗*A*.



If *C*=*A*∗*B*, then C is a 3x3 matrix.

**Correct**

Since A and B are both 3x3 matrices, their product is 3x3. More generally, if A were an *m*×*n*. matrix, and B a *n*×*o* matrix, then C would be *m*×*o*. (In our example, *m*=*n*=*o*=3.)



*A*∗*B*∗*A*=*B*∗*A*∗*B*

**Un-selected is correct**



*A*∗*B*=*B*∗*A*

**This should not be selected**

We saw in the lecture that matrix multiplication is not commutative in general.

Lol goofed on the last q