Name: _____

DATA 470 — Fall 2025

Quiz #3

Sep. 4, 2025

1. A two-dimensional array of numbers is called a:

   ☑ "matrix" (pronounced MAY-tricks)

   ◯ "matrice" (pronounced MAY-truh-see)

2. What is the name of the following mathematical object?

$$\begin{bmatrix} -3 \\ 4 \\ 2 \end{bmatrix}$$

   ◯ a row vector

   ☑ a column vector

3. What are the dimensions of M?

$$M = \begin{bmatrix} 2 & 9 & 11 & -3 \\ 1 & 0 & \pi & 4 \\ -3.2 & -9.6 & -1.1 & 2 \end{bmatrix}$$

   3×4.

4. What's the value of $M_{0,2}$?

   11.

5. What is the result of the following operations? (Note: if any of the operations are impossible/undefined, simply write "*u cant do dat*" instead of giving a mathematical answer.)

   (a) $M^\intercal$ (recall that M was defined in question 3).

$$M^\intercal = \begin{bmatrix} 2 & 1 & -3.2 \\ 9 & 0 & -9.6 \\ 11 & \pi & -1.1 \\ -3 & 4 & 2 \end{bmatrix}$$

   (b) $3 \cdot \begin{bmatrix} 1 & 2 \\ 3 & 4 \end{bmatrix}$

$$\begin{bmatrix} 3 & 6 \\ 9 & 12 \end{bmatrix}$$

(c) $\begin{bmatrix} 2 & 1 & 2 \\ 1 & 2 & 1 \\ 3 & 3 & -1 \end{bmatrix} \cdot \begin{bmatrix} 1 & 2 & 4 \\ 3 & 0 & 4 \end{bmatrix}$

u cant do dat

(d) $\begin{bmatrix} 2 & 1 & 2 \\ 3 & 3 & -1 \end{bmatrix} \cdot \begin{bmatrix} 1 & 2 & 4 \\ 3 & 0 & 4 \end{bmatrix}$

u cant do dat

(e) $\begin{bmatrix} 2 & 1 & 2 \\ 3 & 3 & -1 \end{bmatrix} + \begin{bmatrix} 1 & 2 & 4 \\ 3 & 0 & 4 \end{bmatrix}$

$\begin{bmatrix} 3 & 3 & 6 \\ 6 & 3 & 3 \end{bmatrix}$

(f) $\begin{bmatrix} 2 & 1 \\ 1 & 2 \\ 3 & 3 \end{bmatrix} \cdot \begin{bmatrix} 5 \\ 5 \end{bmatrix}$

$\begin{bmatrix} 15 \\ 15 \\ 30 \end{bmatrix}$

(g) $\begin{bmatrix} 2 & 1 \\ 1 & 2 \\ 3 & 3 \end{bmatrix} \cdot \begin{bmatrix} 5 & 5 \\ 5 & 5 \end{bmatrix}$

$\begin{bmatrix} 15 & 15 \\ 15 & 15 \\ 30 & 30 \end{bmatrix}$

(h) $\begin{bmatrix} 2 & 1 \\ 1 & 2 \\ 3 & 3 \end{bmatrix}^{\intercal} \cdot \begin{bmatrix} 5 & 5 \\ 5 & 5 \end{bmatrix}^{\intercal}$

u cant do dat