Key

Quiz 6

For the following questions, use the matrices defined below.

$$A = \begin{bmatrix} -3 & 0 & 5 \\ -1 & 2 & 4 \end{bmatrix}, B = \begin{bmatrix} 6 & 1 \\ 3 & 0 \\ 7 & 2 \end{bmatrix}, C = \begin{bmatrix} 4 & 2 \\ 5 & 3 \end{bmatrix}, D = \begin{bmatrix} 3 & 4 & 7 \\ 5 & 2 & -3 \\ -2 & 0 & 1 \end{bmatrix}, \text{ and } E = \begin{bmatrix} 1 & -2 & 5 \\ 0 & 3 & -1 \end{bmatrix}$$

1. (2 points) What is the value of e_{23}?

-1

2. (2 points) Compute $3A - 2E$

$$3A-2E = \begin{bmatrix} -9 & 0 & 15 \\ -3 & 6 & 12 \end{bmatrix} + \begin{bmatrix} -2 & 4 & -10 \\ 0 & -6 & +2 \end{bmatrix}$$

$$= \begin{bmatrix} -11 & 4 & 5 \\ -3 & 0 & 14 \end{bmatrix}$$

3. (2 points) Compute $A \cdot B + C$

$$AB+C = \begin{bmatrix} -3 & 0 & 5 \\ -1 & 2 & 4 \end{bmatrix} \begin{bmatrix} 6 & 1 \\ 3 & 0 \\ 7 & 2 \end{bmatrix} + \begin{bmatrix} 4 & 2 \\ 5 & 3 \end{bmatrix}$$

$$= \begin{bmatrix} 17 & 7 \\ 28 & 7 \end{bmatrix} + \begin{bmatrix} 4 & 2 \\ 5 & 3 \end{bmatrix}$$

$$= \begin{bmatrix} 21 & 9 \\ 33 & 10 \end{bmatrix}$$

4. (2 points) Find the transpose of matrix D.

$$D^T = \begin{bmatrix} 3 & 5 & -2 \\ 4 & 2 & 0 \\ 7 & -3 & 1 \end{bmatrix}$$

5. (2 points) Find the inverse of matrix C.

$$C^{-1} = \frac{1}{4 \cdot 3 - 2 \cdot 5} \begin{bmatrix} 3 & -2 \\ -5 & 4 \end{bmatrix} = \frac{1}{2} \begin{bmatrix} 3 & -2 \\ -5 & 4 \end{bmatrix}$$

$$= \begin{bmatrix} 3/2 & -1 \\ -5/2 & 2 \end{bmatrix}$$