

Quiz number 3 Solutions

Show all work. How you get your answer is just as important, if not more important, than the answer itself. If you think it, write it!

For the matrices

$$A = \begin{pmatrix} 1 & -2 & 0 \\ 3 & -2 & 1 \end{pmatrix}, B = \begin{pmatrix} 4 & 3 \\ -3 & 2 \\ 0 & 3 \end{pmatrix}, C = \begin{pmatrix} 7 & 5 \\ -3 & 2 \\ -1 & 1 \end{pmatrix}, \text{ compute}$$

$$\begin{aligned} \text{(a): } AB &= \begin{pmatrix} 1 & -2 & 0 \\ 3 & -2 & 1 \end{pmatrix} \begin{pmatrix} 4 & 3 \\ -3 & 2 \\ 0 & 3 \end{pmatrix} \\ &= \begin{pmatrix} 1 \cdot 4 + (-2) \cdot (-3) + 0 \cdot 0 & 1 \cdot 3 + (-2) \cdot 2 + 0 \cdot 3 \\ 3 \cdot 4 + (-2) \cdot (-3) + 1 \cdot 0 & 3 \cdot 3 + (-2) \cdot 2 + 1 \cdot 3 \end{pmatrix} = \begin{pmatrix} 10 & -1 \\ 18 & 8 \end{pmatrix} \end{aligned}$$

$$\begin{aligned} \text{(b): } CA &= \begin{pmatrix} 7 & 5 \\ -3 & 2 \\ -1 & 1 \end{pmatrix} \begin{pmatrix} 1 & -2 & 0 \\ 3 & -2 & 1 \end{pmatrix} \\ &= \begin{pmatrix} 7 \cdot 1 + 5 \cdot 3 & 7 \cdot (-2) + 5 \cdot (-2) & 7 \cdot 0 + 5 \cdot 1 \\ (-3) \cdot 1 + 2 \cdot 3 & (-3) \cdot (-2) + 2 \cdot (-2) & (-3) \cdot 0 + 2 \cdot 1 \\ (-1) \cdot 1 + 1 \cdot 3 & (-1) \cdot (-2) + 1 \cdot (-2) & (-1) \cdot 0 + 1 \cdot 1 \end{pmatrix} = \begin{pmatrix} 22 & -24 & 5 \\ 3 & 2 & 2 \\ 2 & 0 & 1 \end{pmatrix} \end{aligned}$$

$$\begin{aligned} \text{(c): } 2B - 3C &= 2 \begin{pmatrix} 4 & 3 \\ -3 & 2 \\ 0 & 3 \end{pmatrix} - 3 \begin{pmatrix} 7 & 5 \\ -3 & 2 \\ -1 & 1 \end{pmatrix} = \begin{pmatrix} 8 & 6 \\ -6 & 4 \\ 0 & 6 \end{pmatrix} - \begin{pmatrix} 21 & 15 \\ -9 & 6 \\ -3 & 3 \end{pmatrix} \\ &= \begin{pmatrix} 8 - 21 & 6 - 15 \\ -6 - (-9) & 4 - 6 \\ 0 - (-3) & 6 - 3 \end{pmatrix} = \begin{pmatrix} -13 & -9 \\ 3 & -2 \\ 3 & 3 \end{pmatrix} \end{aligned}$$