

AI1110

Assignment 1

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Outline

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Question 2(b)

If $A = \begin{bmatrix} 1 & 3 \\ 3 & 4 \end{bmatrix}$ and

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

and $A^2 - 5B^2 = 5C$. Find matrix C where C is a 2 by 2 matrix.

Solution

$$A^2 = \begin{bmatrix} 1 & 3 \\ 3 & 4 \end{bmatrix} \times \begin{bmatrix} 1 & 3 \\ 3 & 4 \end{bmatrix}$$

$$A^2 = \begin{bmatrix} 10 & 15 \\ 15 & 25 \end{bmatrix}$$

$$B^2 = \begin{bmatrix} -2 & 1 \\ -3 & 2 \end{bmatrix} \times \begin{bmatrix} -2 & 1 \\ -3 & 2 \end{bmatrix}$$

$$B^2 = \begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}$$

$$5B^2 = \begin{bmatrix} 5 & 0 \\ 0 & 5 \end{bmatrix}$$

$$5C = A^2 - 5B^2$$

$$5C = \begin{bmatrix} 10 & 15 \\ 15 & 25 \end{bmatrix} - \begin{bmatrix} 5 & 0 \\ 0 & 5 \end{bmatrix}$$

$$5C = \begin{bmatrix} 5 & 15 \\ 15 & 20 \end{bmatrix}$$

Answer

$$C = \begin{bmatrix} 1 & 3 \\ 3 & 4 \end{bmatrix}$$