

QUESTION

Evaluate the product  $\mathbf{AB}$  of the matrices

$$\mathbf{A} = \begin{pmatrix} 2 & -1 \\ -2 & 0 \\ 1 & 1 \end{pmatrix}, \quad \mathbf{B} = \begin{pmatrix} 1 & -2 & 2 \\ 2 & 0 & 1 \end{pmatrix}.$$

ANSWER

$$\begin{aligned} \mathbf{AB} &= \begin{pmatrix} 2 & -1 \\ -2 & 0 \\ 1 & 1 \end{pmatrix} \begin{pmatrix} 1 & -2 & 1 \\ 2 & 0 & 1 \end{pmatrix} \\ &= \begin{pmatrix} 2(1) - 1(2) & 2(-2) - 1(0) & 2(1) - 1(1) \\ -2(1) + 0 & -2(-2) + 0 & -2(1) + 0 \\ 1(1) + 1(2) & 1(-2) + 0 & 1(1) + 1(1) \end{pmatrix} \\ &= \begin{pmatrix} 0 & -4 & 1 \\ -2 & 4 & -2 \\ 3 & -2 & 2 \end{pmatrix} \end{aligned}$$