

Score:

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SM 261 – Matrix Algebra – Quiz 1
Section 2.2 – The Inverse of a Matrix

1. Let $A = \begin{bmatrix} 3 & -2 \\ 4 & 3 \end{bmatrix}$. Find A^{-1} using:

- Cramer's Rule.
- Row reduction methods, i.e. start with $[A: I_2]$ and reduce to $[I_2: A^{-1}]$. Do not use your calculator.

$$a) \frac{1}{(3)(3) - (2)(4)} \begin{bmatrix} 3 & -2 \\ -4 & 3 \end{bmatrix} = \begin{bmatrix} 3 & -2 \\ -4 & 3 \end{bmatrix}$$

$$b) \left[\begin{array}{cc|cc} 3 & -2 & 1 & 0 \\ 4 & 3 & 0 & 1 \end{array} \right] \xrightarrow{R1/3} \left[\begin{array}{cc|cc} 1 & -2/3 & 1/3 & 0 \\ 4 & 3 & 0 & 1 \end{array} \right] \xrightarrow{R2-4R1}$$

$$\Rightarrow \left[\begin{array}{cc|cc} 1 & -2/3 & 1/3 & 0 \\ 0 & 1/3 & -4/3 & 1 \end{array} \right] \xrightarrow{R2 \times 3} \Rightarrow \left[\begin{array}{cc|cc} 1 & -2/3 & 1/3 & 0 \\ 0 & 1 & -4 & 3 \end{array} \right] \xrightarrow{R1 + 2/3 R2}$$

$$\Rightarrow \left[\begin{array}{cc|cc} 1 & 0 & 9/3 & -2 \\ 0 & 1 & -4 & 3 \end{array} \right]$$

$$\hookrightarrow A^{-1} = \begin{bmatrix} 3 & -2 \\ -4 & 3 \end{bmatrix} \checkmark \checkmark$$