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7-6 NOTES ON INVERSE MATRICES

Ex 1 Solve: $x + y - z = 6$
 $-2x + 3y + z = -5$
 $3x + y - 2z = -16$

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Ex 2 Solve: $\frac{1}{4} \cdot 4x = 20 \cdot \frac{1}{4}$
 $x = 5$

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Ex 3 Show that $\begin{bmatrix} 1 & -2 \\ 1 & -1 \end{bmatrix}$ is the inverse of $\begin{bmatrix} -1 & 2 \\ -1 & 1 \end{bmatrix}$

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

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Ex 4 Find the inverse of $\begin{bmatrix} 1 & -4 \\ 2 & 9 \end{bmatrix}$ GOAL: $\begin{bmatrix} 1 & 0 & \# & \# \\ 0 & 1 & \# & \# \end{bmatrix}$

$$\begin{bmatrix} 1 & 4 & 1 & 0 \\ 2 & 9 & 0 & 1 \end{bmatrix} \xrightarrow{-2} \begin{bmatrix} 1 & 4 & 1 & 0 \\ 0 & 1 & -2 & 1 \end{bmatrix} \xrightarrow{-4} \begin{bmatrix} 1 & 0 & 9 & -4 \\ 0 & 1 & -2 & 1 \end{bmatrix}$$

$$\begin{bmatrix} 1 & 0 & 9 & -4 \\ 0 & 1 & -2 & 1 \end{bmatrix} \xrightarrow{-9} \begin{bmatrix} 1 & 0 & 0 & -49 \\ 0 & 1 & -2 & 1 \end{bmatrix} \xrightarrow{+2} \begin{bmatrix} 1 & 0 & 0 & -49 \\ 0 & 1 & 0 & -37 \end{bmatrix}$$

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Ex 5 Find the inverse of $\begin{bmatrix} 1 & -1 & 0 \\ 1 & 0 & -1 \\ 6 & -2 & -3 \end{bmatrix}$

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

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Ex 6 Solve $x + 4y = 2$
 $-x - 3y = 1$

$$\begin{bmatrix} 1 & 4 \\ -1 & -3 \end{bmatrix} \begin{bmatrix} x \\ y \end{bmatrix} = \begin{bmatrix} 2 \\ 1 \end{bmatrix}$$

$$\begin{bmatrix} x \\ y \end{bmatrix} = \begin{bmatrix} -10 \\ 3 \end{bmatrix}$$

$(-10, 3)$

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Ex 7 Solve: $x + y - z = 6$
 $-2x + 3y + z = -5$
 $3x + y - 2z = -16$

$$\begin{bmatrix} 1 & 1 & -1 \\ -2 & 3 & 1 \\ 3 & 1 & -2 \end{bmatrix} \begin{bmatrix} x \\ y \\ z \end{bmatrix} = \begin{bmatrix} 6 \\ -5 \\ -16 \end{bmatrix}$$

$$[A]^{-1}[B] = \begin{bmatrix} -37 \\ -9 \\ -52 \end{bmatrix}$$

$$\begin{bmatrix} x \\ y \\ z \end{bmatrix} = \begin{bmatrix} -37 \\ -9 \\ -52 \end{bmatrix}$$

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Homework
 p.547
 #1-5, 11-17, 41-43 odds

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