Homework: Multiplicative Inverses of Matrices and Matrix Equations

In Problems 1-3, use the fact that if $A=\begin{bmatrix} a & b \\ c & d \end{bmatrix}$ then $A^{-1}=\frac{1}{ad-bc}\begin{bmatrix} d & -b \\ -c & a \end{bmatrix}$ to find the inverse of each matrix, if possible.

1. $A=\begin{bmatrix} 2 & -1 \\ 3 & -4 \end{bmatrix}$	2. $A=\begin{bmatrix} -5 & 2 \\ 3 & 1 \end{bmatrix}$
3. $A=\begin{bmatrix} 8 & 2 \\ 4 & 1 \end{bmatrix}$	

In Problems 4-8, find A^{-1}

4. $A=\begin{bmatrix} 5 & 2 \\ -3 & -4 \end{bmatrix}$	5. $A=\begin{bmatrix} 7 & -1 & -2 \\ 0 & 3 & -4 \\ 2 & 1 & 8 \end{bmatrix}$
6. $A=\begin{bmatrix} 1 & 2 & -4 \\ 1 & -5 & 0 \\ -4 & 0 & -6 \end{bmatrix}$	7. $A=\begin{bmatrix} 3 & 0 & 1 \\ -4 & 2 & 0 \\ -3 & -7 & 6 \end{bmatrix}$
8. $A=\begin{bmatrix} 2 & -1 & 3 & 5 \\ 1 & -6 & 1 & 0 \\ 2 & -3 & 1 & 4 \\ -5 & 1 & 0 & 2 \end{bmatrix}$	

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In Problems 9-11, solve the linear system using matrices

9. $3x + y + z = -2$ $4x - y - z = 1$ $x - 2y - 3z = -3$	10. $x - y + 2z = 3$ $x - y = -3$ $3x + y + 2z = 4$
11. $w + 3x - 4y + 2z = -1$ $w - x - y - z = -2$ $w + 3x - 4y + z = 8$ $w + 2x - y - 3z = -2$	