

## Inverses of Matrices

**Find the inverse of each matrix.**

1)  $\begin{bmatrix} 9 & 3 \\ 5 & -5 \end{bmatrix}$

2)  $\begin{bmatrix} -4 & 1 \\ 7 & -2 \end{bmatrix}$

3)  $\begin{bmatrix} -10 & -10 \\ 4 & -3 \end{bmatrix}$

4)  $\begin{bmatrix} 1 & 0 \\ 6 & -1 \end{bmatrix}$

5)  $\begin{bmatrix} -5 & 8 \\ 7 & -9 \end{bmatrix}$

6)  $\begin{bmatrix} -2 & 1 \\ -4 & 2 \end{bmatrix}$

**Solve each system using inverse matrices.**

7)  $\begin{cases} -x + 4y = -20 \\ -4x - 8y = 16 \end{cases}$

8)  $\begin{cases} 2x + 2y = -22 \\ x - 5y = 1 \end{cases}$

9)  $\begin{cases} 2x - 3y = -21 \\ 4x + 6y = -30 \end{cases}$

10)  $\begin{cases} 2x - 6y = -26 \\ 10x - 12y = -22 \end{cases}$

11)  $\begin{cases} -8x + 20y = 12 \\ -3x + 10y = 12 \end{cases}$

12)  $\begin{cases} 9x + 9y = 0 \\ x - 4y = -10 \end{cases}$

## Answers to Inverses of Matrices

$$1) \begin{bmatrix} \frac{1}{12} & \frac{1}{20} \\ \frac{1}{12} & -\frac{3}{20} \end{bmatrix}$$

$$5) \begin{bmatrix} \frac{9}{11} & \frac{8}{11} \\ \frac{7}{11} & \frac{5}{11} \end{bmatrix}$$

$$9) (-9, 1)$$

$$2) \begin{bmatrix} -2 & -1 \\ -7 & -4 \end{bmatrix}$$

6) No inverse exists

$$10) (5, 6)$$

$$3) \begin{bmatrix} -\frac{3}{70} & \frac{1}{7} \\ -\frac{2}{35} & -\frac{1}{7} \end{bmatrix}$$

$$7) (4, -4)$$

$$11) (6, 3)$$

$$4) \begin{bmatrix} 1 & 0 \\ 6 & -1 \end{bmatrix}$$

$$8) (-9, -2)$$

$$12) (-2, 2)$$