

**Simplify. Write "undefined" for expressions that are undefined.**

$$1) 4 \left( \begin{bmatrix} 2 \\ -5 \end{bmatrix} - \begin{bmatrix} 3 \\ -4 \end{bmatrix} \right)$$

$$2) -2 \cdot \left( \begin{bmatrix} -6 & 0 \\ -2 & 5 \\ 5 & -4 \end{bmatrix} \cdot \begin{bmatrix} -6 & 4 \\ -4 & -3 \\ 5 & -1 \end{bmatrix} \right)$$

$$3) -3 \left( \begin{bmatrix} 5 & -6 \\ -1 & 4 \end{bmatrix} - \begin{bmatrix} 0 & -4 \\ -2 & -2 \end{bmatrix} \right)$$

$$4) \begin{bmatrix} -3 & -3 \\ 4 & 3 \end{bmatrix} \cdot \left( \begin{bmatrix} -4 & -4 \\ -5 & -6 \end{bmatrix} - \begin{bmatrix} 2 & -6 \\ -3 & -4 \end{bmatrix} \right)$$

$$5) \begin{bmatrix} 1 & 4 & -2 \\ 0 & -2 & -3 \end{bmatrix} - \begin{bmatrix} 0 & 5 & -5 \\ 6 & 2 & -6 \end{bmatrix} \cdot \begin{bmatrix} 0 & 2 & -1 \\ 1 & 4 & 4 \end{bmatrix}$$

$$6) \left( \begin{bmatrix} -6 & 0 \\ 4 & 0 \end{bmatrix} + \begin{bmatrix} 5 & -6 \\ 0 & -5 \end{bmatrix} \right) \cdot \begin{bmatrix} -1 & 2 \\ 4 & 6 \end{bmatrix}$$

**Find the inverse of each matrix.**

$$7) \begin{bmatrix} 2 & 2 \\ -8 & 2 \end{bmatrix}$$

$$8) \begin{bmatrix} 9 & -9 \\ 2 & 1 \end{bmatrix}$$

**Evaluate each determinant.**

$$9) \begin{vmatrix} -1 & 2 \\ -3 & 1 \end{vmatrix}$$

$$10) \begin{vmatrix} 3 & 0 \\ -5 & -1 \end{vmatrix}$$

**Solve each system by elimination.**

$$11) \begin{aligned} x + 4y + 3z &= -18 \\ 5x + y + 2z &= -15 \\ -x - 2y - 6z &= -3 \end{aligned}$$

$$12) \begin{aligned} 2x - 5y - z &= 16 \\ -2x + 3y + 4z &= 3 \\ -4x + 4y - 5z &= -23 \end{aligned}$$

$$13) \begin{aligned} -6x + 5y - 4z &= 0 \\ 2x + 2y + z &= 7 \\ 6x + y - 4z &= 4 \end{aligned}$$