

## 4.8 Using Matrices to Solve Systems of Equations

- 1) Write matrix equations for systems of equations,
- 2) Solve systems of equations using matrix equations.

$$\begin{array}{l} 5x + 7y = 11 \\ 3x + 8y = 18 \end{array} \longrightarrow \begin{bmatrix} 5 & 7 \\ 3 & 8 \end{bmatrix} \cdot \begin{bmatrix} x \\ y \end{bmatrix} = \begin{bmatrix} 11 \\ 18 \end{bmatrix}$$

**This is in Matrix Equation form.**

Write  $5x - 6y = -47$  and  
 $3x + 2y = -17$  as a Matrix Equation.

# Solving systems of equations using inverse matrices

Step 1) write the problem as a matrix equation,

Step 2) multiply the right side by the inverse matrix, (the inverse matrix goes first).

Solve  $6x + 2y = 11$  and  $3x - 8y = 1$  using inverse matrices.

Solve  $6a - 9b = -18$  and  $8a - 12b = 24$  using inverse matrices.

# Calculator FYI

$$3x - 2y + z = 0$$

$$2x + 3y - z = 17$$

$$5x - y + 4z = -7$$

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

$$B = \begin{bmatrix} 0 \\ 17 \\ -7 \end{bmatrix}$$

$$A^{-1} \cdot B = \text{answer}$$

# Homework

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