

## Solving Systems Using Elimination

## The Elimination Method

**STEP 1** Multiply one or both of the equations by a constant to obtain coefficients that differ only in sign for one of the variables.

**STEP 2** Add the revised equations from Step 1. Combining like terms will eliminate one of the variables. Solve for the remaining variable.

**STEP 3** Substitute the value obtained in Step 2 into either of the original equations and solve for the other variable.

Example 1:

Solve this system using the elimination method:

$$\begin{array}{r}
 4x - 2y = -14 \\
 -4x + 12y = -16 \\
 \hline
 10y = -30 \\
 y = -3
 \end{array}
 \quad \longrightarrow \quad
 \begin{array}{r}
 4x - 2(-3) = -14 \\
 4x + 6 = -14 \\
 4x = -20 \\
 x = -5
 \end{array}$$

$(-5, -3)$

Key Point: Try to "make opposites" on one of the variables.

Example 2:

$$\begin{array}{r}
 4x - 4y = 16 \\
 2(-2x - y = 7) \\
 \hline
 -6y = 30 \\
 y = -5
 \end{array}$$

$(-1, -5)$

$$\begin{array}{r}
 4x - 4(-5) = 16 \\
 4x + 20 = 16 \\
 4x = -4 \\
 x = -1
 \end{array}$$