

Elimination

Example 1:

$$3x + y = 2$$

$$3(x - 2y = 10) \quad + \quad \begin{array}{r} 3x + y = 2 \\ -3x + 6y = -30 \\ \hline 7y = -28 \\ y = -4 \end{array}$$

$$\begin{array}{r} 3x + (-4) = 2 \\ +4 \quad +4 \\ \hline 3x = 6 \\ x = 2 \end{array}$$

$$\begin{array}{r} 3x = 6 \\ \hline 3 \quad 3 \\ \hline x = 2 \end{array}$$

$$\boxed{y = -4}$$

$$(2, -4)$$

One Solution

Elimination

Example 2:

$$\begin{array}{l} +2 \\ (2x + y = 6) \end{array}$$

$$-4x - 2y = 5$$

$$\begin{array}{r} \cancel{4x} + \cancel{2y} = 12 \\ + \quad \cancel{-4x} - \cancel{2y} = 5 \\ \hline \end{array}$$

$$0 = 17$$

NO solution

Elimination

Example 3:

$$\begin{cases} -x + 5y = -6 \end{cases}$$

$$2x - 10y = 12$$

$$-2x + 10y = -12$$

$$2x - 10y = 12$$

$$0 = 0$$

Infinitely
many
Solutions

$$\begin{array}{rcl} 16x - 10y = 10 & & 3(5x + 4y = -30) \\ 2(-8x - 6y = 6) & & -5(3x - 9y = -18) \end{array}$$

$$\begin{array}{r} 16x - 10y = 10 \\ -16x - 12y = 12 \\ \hline \end{array}$$

$$\begin{array}{r} -22y = 22 \\ \hline y = -1 \end{array}$$

$$\boxed{y = -1 \quad x = 0}$$

$$\begin{array}{l} -8x - 6(-1) = 6 \\ -8x + 6 = 6 \\ -8x = 0 \end{array} \quad \begin{array}{l} \text{ONE} \\ \text{SOLUTION} \end{array}$$