

Try It!

a. $\begin{cases} y = -2x - 1 \\ x - 2y = 12 \end{cases}$

$$x(-2)(-2x - 1) = 12$$

$$x + 4x + 2 = 12$$
$$\quad \quad \quad -2 \quad -2$$

$$\frac{5x = 10}{5 \quad 5}$$
$$\boxed{x = 2}$$

$$\boxed{P(2, -5)}$$

$$y = -2(2) - 1$$
$$= -4 - 1$$

$$\boxed{y = -5}$$

ck

$$(2) - 2(-5) ? 12$$

$$2 + 10 ? 12$$

$$12 = 12 \checkmark$$

b. $\begin{cases} -3x - 7y = 1 \\ y = -2x + 3 \end{cases}$

$$-3x(-7)(-2x + 3) = 1$$

$$\boxed{-3x + 14x} - 21 = 1$$
$$\quad \quad \quad +21 \quad +21$$

$$\frac{11x = 22}{11 \quad 11}$$

$$\boxed{x = 2}$$

$$\boxed{P(2, -1)}$$

$$y = -2(2) + 3$$

$$= -4 + 3$$

$$\boxed{y = -1}$$

ck

$$-3(2) - 7(-1) ? 1$$

$$-6 + 7 ? 1$$

$$1 = 1 \checkmark$$

Special Cases

3. $\begin{cases} y = -3x + 4 \\ 6x + 2y = 7 \end{cases}$

$$6x + 2(-3x + 4) = 7$$

$$\cancel{6x} - \cancel{6x} + 8 = 7$$

$$8 \neq 7$$

No solution

No POI, parallel

4. $\begin{cases} y = 3x - 6 \\ -3x + y = -6 \end{cases}$

$$\cancel{-3x} + (3x - 6) = -6$$

$$-6 = -6$$

Identity,

Infinite

many solutions.

Same eqn.

Try It!

Solve the following system:

$$\begin{cases} y = 2x - 5 \\ -2x + y = 7 \end{cases}$$

$$-2x + (2x - 5) = 7$$

$$-5 = 7$$

No solution

parallel lines.

Practice: Solve the following systems.

1.
$$\begin{cases} 3x - y = 30 \\ y = x + 14 \end{cases}$$

$$3x - (-x + 14) = 30$$

$$\boxed{3x + x} - 14 = 30$$

$$\begin{array}{r} 4x - 14 = 30 \\ +14 \quad +14 \\ \hline 4x = 44 \end{array}$$

$$\frac{4x}{4} = \frac{44}{4}$$

$$\boxed{x = 11}$$

$$y = -(11) + 14$$

$$\boxed{y = 3}$$

$$\boxed{P(11, 3)}$$

ck

$$\begin{aligned} 3(11) - (3) &? 30 \\ 33 - 3 &? 30 \\ 30 &= 30 \checkmark \end{aligned}$$

2.

$$\begin{cases} x = -6y + 15 \\ -x + 4y = 5 \end{cases}$$

$$-(-6y + 15) + 4y = 5$$

$$\boxed{6y} - 15 + 4y = 5$$

$$\begin{array}{r} 10y - 15 = 5 \\ +15 \quad +15 \\ \hline 10y = 20 \end{array}$$

$$\frac{10y}{10} = \frac{20}{10}$$

$$\boxed{y = 2}$$

$$x = -6(2) + 15$$

$$= -12 + 15$$

$$\boxed{x = 3}$$

$$\boxed{P(3, 2)}$$

ck

$$\begin{aligned} -(3) + 4(2) &? 5 \\ -3 + 8 &? 5 \\ 5 &= 5 \checkmark \end{aligned}$$

3.
$$\begin{cases} y = \frac{1}{2}x + 2 \\ x - 2y = -4 \end{cases}$$

$$x - 2\left(\frac{1}{2}x + 2\right) = -4$$

$$x - x - 4 = -4$$

$$-4 = -4$$

identity; infinitely many solutions.

