

p262 4.1

$$25. \quad \begin{aligned} 6x + 5y &= -3 \\ -x - \frac{5}{6}y &= -7 \end{aligned}$$

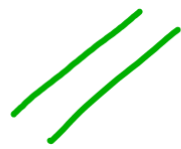
$$\begin{aligned} 6x + 5y &= -3 \\ 5y &= -6x - 3 \end{aligned}$$

$$y = -\frac{6x}{5} - \frac{3}{5}$$

$$-x - \frac{5}{6} \left(-\frac{6x}{5} - \frac{3}{5} \right) = -7$$

$$-x + x + \frac{1}{2} = -7$$

$$\frac{1}{2} \neq -7$$



No Solution

$$29. \quad 3x - 7y + 6 = 0$$

$$x^2 - y^2 = 4$$

$$3x - 7y = -6$$

$$-7y = -3x - 6$$

$$y = \frac{3}{7}x + \frac{6}{7}$$

$$x^2 - \left(\frac{3}{7}x + \frac{6}{7}\right)^2 = 4$$

$$x^2 - \left[\left(\frac{3}{7}x + \frac{6}{7}\right)\left(\frac{3}{7}x + \frac{6}{7}\right)\right] = 4$$

$$x^2 - \left[\frac{9}{49}x^2 + \frac{18}{49}x + \frac{18}{49}x + \frac{36}{49}\right] = 4$$

$$\frac{49}{49}x^2 - \left[\frac{9}{49}x^2 + \frac{36}{49}x + \frac{36}{49}\right] = 4$$

$$\frac{40}{49}x^2 - \frac{36}{49}x - \frac{36}{49} = 4$$

$$40 \frac{40}{49}x^2 - \frac{36}{49}x - \frac{232}{49} = 0$$

$$40x^2 - 36x - 232 = 0$$

$$4(10x^2 - 9x - 58) = 0$$

$$4(10x - 29)(x + 2) = 0$$

$$4 \neq 0 \quad 10x - 29 = 0 \quad x + 2 = 0$$

$$x = \frac{29}{10} \quad x = -2$$

$$y = \frac{3}{7}x + \frac{6}{7}$$

$$y = \frac{3}{7}\left(\frac{29}{10}\right) + \frac{6}{7} \quad y = \frac{3}{7}\left(-2\right) + \frac{6}{7}$$

$$y = 0$$

$$y = \frac{21}{10}$$

$$\left(\frac{29}{10}, \frac{21}{10}\right) \quad (-2, 0)$$

$$49. \quad C = 15,000 + 3.71x$$

$$R = 16.21x$$

$$R = C$$

$$16.21x = 15,000 + 3.71x$$

Solving Systems of Equations

1. Graph

2. Substitution

3. Elimination

Add

Subtract

$$4.2 \quad -x + 3y = 2$$

$$\text{Add} \quad + \quad x - 4y = -4$$

Coefficients
of 1 variable
must be
opposites

$$-y = -2$$

$$\frac{-1}{-1} \quad \frac{-1}{-1}$$

$$y = 2$$

Substitute
Solve for
x

$$x - 4(2) = -4$$

$$x - 8 = -4$$

$$x = 4$$

$$(4, 2)$$

$$5 \cdot x + 7y = 12$$

$$7 \cdot 3x - 5y = 10$$

$$5x + 35y = 60$$

$$+ 21x - 35y = 70$$

$$\frac{26x}{26} = \frac{130}{26}$$

$$x = 5$$

$$x + 7y = 12$$

$$5 + 7y = 12$$

$$7y = 7$$

$$y = 1$$

$$(5, 1)$$

$$\begin{array}{r} 3x + 3y = 7 \\ - 3x + 5y = 3 \\ \hline \end{array}$$

Subtract
Coefficients
same on 1
variable

$$\begin{array}{r} -2y = 4 \\ \underline{-2} \quad \underline{-2} \end{array}$$

$$y = -2$$

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

$$\begin{array}{r} 3x - 6 = 7 \\ \quad \quad \quad +6 \quad \quad +6 \end{array}$$

$$\begin{array}{r} 3x = 13 \\ \underline{\quad} \quad \underline{\quad} \\ 3 \quad \quad 3 \end{array}$$

$$x = \frac{13}{3}$$

$$\left(\frac{13}{3}, -2\right)$$

$$2 \cdot \begin{array}{l} x - y = 1 \\ -2x + 2y = 5 \end{array}$$

$$\begin{array}{r} 2x - 2y = 2 \\ + \quad -2x + 2y = 5 \\ \hline 0 \neq 7 \end{array}$$

No Solution

$$2. \quad \begin{aligned} 3x - 2y &= 6 \\ -6x + 4y &= -12 \end{aligned}$$

Add

$$\begin{aligned} 6x - 4y &= 12 \\ + 6x + 4y &= -12 \\ \hline \end{aligned}$$

$$0 = 0 \quad \text{True}$$

Same line

Infinitely Many Solutions

$$25. \frac{3(x+3)}{4} + \frac{4(y-1)}{3} = 1$$

$$3x + 9 + 4y - 4 = 12$$

$$\begin{aligned} 3x + 4y &= 7 \\ x - y &= 3 \end{aligned}$$