

Systems of Equations: Lesson 2

Substitution: Worksheet 1

Name: Answers!

MATH 4 ALL

Solve these by using substitution:

$$\begin{cases} y = -x + 7 \\ y = 2x - 11 \end{cases}$$

$$\begin{array}{r} -x + 7 = 2x - 11 \\ \hline +x \quad +x \\ \hline 7 = 3x - 11 \\ +11 \quad +11 \\ \hline 18 = 3x \\ \frac{18}{3} = \frac{3x}{3} \quad x = 6 \end{array}$$

$$\begin{array}{l} y = -(6) + 7 \\ y = 1 \\ \hline \boxed{(6, 1)} \end{array}$$

$$\begin{cases} y = -5x + 7 \\ y = -10x - 3 \end{cases}$$

$$\begin{array}{r} -5x + 7 = -10x - 3 \\ +10x \quad +10x \\ \hline 5x + 7 = -3 \\ \hline 5x = -10 \\ \frac{5x}{5} = \frac{-10}{5} \\ x = -2 \end{array}$$

$$\begin{array}{l} y = -5(-2) + 7 \\ y = 10 + 7 \\ y = 17 \\ \hline \boxed{(-2, 17)} \end{array}$$

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

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

$$\begin{array}{l} y = 6x \\ y = 6(-3) \\ y = -18 \\ \hline \boxed{(-3, -18)} \end{array}$$

$$\begin{cases} y = \frac{2}{5}x - 1 \\ x = 5y \end{cases}$$

$$\begin{array}{r} y = \frac{2}{5}(5y) - 1 \\ y = 2y - 1 \\ \hline -2y \quad -2y \\ \hline -y = -1 \\ \hline y = 1 \end{array}$$

$$\begin{array}{l} x = 5(1) \\ x = 5 \\ \hline \boxed{(5, 1)} \end{array}$$

$$\begin{cases} 2x - 3y = 12 \\ y = x - 5 \end{cases}$$

$$\begin{array}{r} 2x - 3(x - 5) = 12 \\ 2x - 3x + 15 = 12 \\ \hline -x + 15 = 12 \\ \hline -15 \quad -15 \\ \hline -x = -3 \\ x = 3 \end{array}$$

$$\begin{array}{l} y = x - 5 \\ y = 3 - 5 \\ y = -2 \\ \hline \boxed{(3, -2)} \end{array}$$

$$\begin{cases} 8x + 3y = 16 \\ y = x - 2 \end{cases}$$

$$\begin{array}{r} 8x + 3(x - 2) = 16 \\ 8x + 3x - 6 = 16 \\ \hline 11x - 6 = 16 \\ \hline +6 \quad +6 \\ \hline 11x = 22 \\ \frac{11x}{11} = \frac{22}{11} \\ x = 2 \end{array}$$

$$\begin{array}{l} y = x - 2 \\ y = 2 - 2 \\ y = 0 \\ \hline \boxed{(2, 0)} \end{array}$$

$$\begin{cases} -2x - 3y = 42 \\ \frac{4}{3}x - y = 2 \end{cases}$$

$$\begin{array}{r} -\frac{4}{3}x \\ \hline -\frac{4}{3}x - y = 2 \\ -\frac{4}{3}x = 2 - \frac{4}{3}x \\ \hline -y = 2 - \frac{4}{3}x \\ = -\frac{3}{1} - \frac{4}{3}x \\ = -\frac{9}{3} - \frac{4}{3}x \\ = -\frac{9+4x}{3} \\ = -2 - \frac{4}{3}x \end{array}$$

$$-2x - 3\left(-2 + \frac{4}{3}x\right) = 42$$

$$-2x + 6 - 4x = 42$$

$$-6x + 6 = 42$$

$$\begin{array}{r} -6x + 6 = 42 \\ + 6 - 6 \\ \hline -6x = 36 \\ \div -6 \\ \hline x = -6 \end{array}$$

$$(-6, -10)$$

$$y = -2 + \frac{4}{3}(-6)$$

$$-2 + -8 = -10$$

$$\begin{cases} -6x - 5y = -10 \\ x + y = 5 \end{cases}$$

$$x = 5 - y$$

$$-6(5 - y) - 5y = -10$$

$$-30 + 6y - 5y = -10$$

$$-30 + y = -10$$

$$y = 20$$

$$x = 5 - 20$$

$$x = -15$$

$$(-15, 20)$$

$$\begin{cases} y - 2x = 24 \\ -4x + y = 14 \end{cases}$$

$$y = 24 + 2x$$

$$-4x + 24 + 2x = 14$$

$$-2x + 24 = 14$$

$$-2x = -10$$

$$x = 5$$

$$y - 2(5) = 24$$

$$y - 10 = 24$$

$$y = 34$$

$$(5, 34)$$