

Homework 17.3

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Solve each system by substitution.

$$1) \begin{array}{l} y = x \\ -x + 3y = -14 \end{array}$$

$$\begin{aligned} -x + 3(x) &= -14 \\ -x + 3x &= -14 \end{aligned}$$

$$\frac{2x}{2} = \frac{-14}{2}$$

$$x = -7$$

$$\begin{aligned} y &= x \\ y &= -7 \\ (-7, -7) \end{aligned}$$

$$3) \begin{array}{l} -2x + 2y = 0 \\ y = -6x \end{array}$$

$$\begin{aligned} -2x + 2(-6x) &= 0 \\ -2x - 12x &= 0 \end{aligned}$$

$$\frac{-14x}{-14} = \frac{0}{-14}$$

$$x = 0$$

$$\begin{aligned} -2(0) + 2y &= 0 \\ 2y &= 0 \\ \frac{2y}{2} &= \frac{0}{2} \\ y &= 0 \\ (0, 0) \end{aligned}$$

$$5) \begin{array}{l} 7x - 4y = 14 \\ y = -7x - 21 \end{array}$$

$$7x - 4(-7x - 21) = 14$$

$$7x + 28x + 84 = 14$$

$$\begin{array}{r} 35x + 84 = 14 \\ -84 -84 \end{array}$$

$$\frac{35x}{35} = \frac{-70}{35}$$

$$x = -2$$

$$y = -7(-2) - 21$$

$$y = 14 - 21$$

$$y = -7$$

$$(-2, -7)$$

$$2) \begin{array}{l} y = -3x - 6 \\ 8x + 4y = -12 \end{array}$$

$$8x + 4(-3x - 6) = -12$$

$$8x - 12x - 24 = -12$$

$$\begin{array}{r} -4x - 24 = -12 \\ +24 +24 \end{array}$$

$$\begin{array}{r} -4x = 12 \\ \cancel{-4} \quad \cancel{-4} \\ x = -3 \end{array}$$

$$y = -3(-3) - 6$$

$$y = 9 - 6$$

$$y = 3$$

$$(-3, 3)$$

$$4) \begin{array}{l} 8x - 2y = 20 \\ y = -8x + 2 \end{array}$$

$$8x - 2(-8x + 2) = 20$$

$$8x + 16x - 4 = 20$$

$$\begin{array}{r} 24x - 4 = 20 \\ +4 +4 \end{array}$$

$$\frac{24x}{24} = \frac{24}{24}$$

$$x = 1$$

$$y = -8(1) + 2$$

$$y = -8 + 2 = -6$$

$$(1, -6)$$

$$6) \begin{array}{l} -2x - y = 0 \\ y = 3x \end{array}$$

$$-2x - (3x) = 0$$

$$-2x - 3x = 0$$

$$-5x = 0$$

$$x = 0$$

$$y = 3x$$

$$y = 3(0)$$

$$y = 0$$

$$(0, 0)$$

Write the slope-intercept form of the equation of the line through the given points.

$$7) \text{ through: } (0, 1) \text{ and } (-4, 0)$$

$$m = \frac{1 - 0}{0 + 4} = \frac{1}{4}$$

$$y - 1 = \frac{1}{4}(x - 0)$$

$$\begin{array}{r} y - 1 = \frac{1}{4}x \\ +1 \quad +1 \end{array} \quad y = \frac{1}{4}x + 1$$

$$m = \frac{1 + 1}{4 - 0} = \frac{2}{4} = \frac{1}{2}$$

$$y - 1 = \frac{1}{2}(x - 4)$$

$$\begin{array}{r} y - 1 = \frac{1}{2}x - 2 \\ +1 \quad +1 \\ y = \frac{1}{2}x - 1 \end{array}$$

Answers to Homework 17.3

1) $(-7, -7)$

2) $(-3, 3)$

5) $(-2, -7)$

6) $(0, 0)$

3) $(0, 0)$

7) $y = \frac{1}{4}x + 1$

4) $(1, -6)$

8) $y = \frac{1}{2}x - 1$