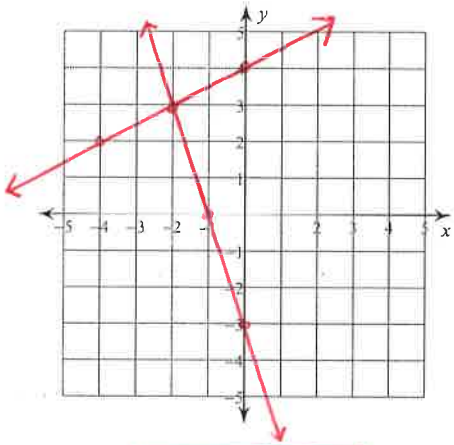


5.1-5.4 Review: Solving Systems of Equations

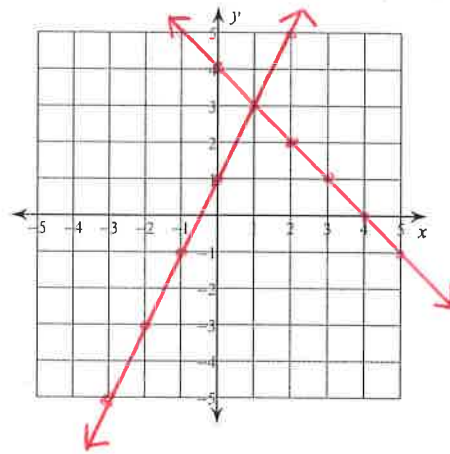
Solve each system by graphing.

1) $y = -3x - 3$ $m = -3$ $b = -3$
 $y = \frac{1}{2}x + 4$ $m = \frac{1}{2}$ $b = 4$



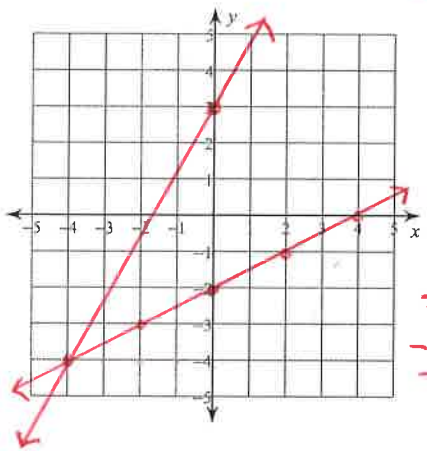
$(-2, 3)$

2) $y = 2x + 1$ $m = 2$ $b = 1$
 $y = -x + 4$ $m = -1$ $b = 4$



$(1, 3)$

3) $x - 2y = 4$
 $7x - 4y = -12$

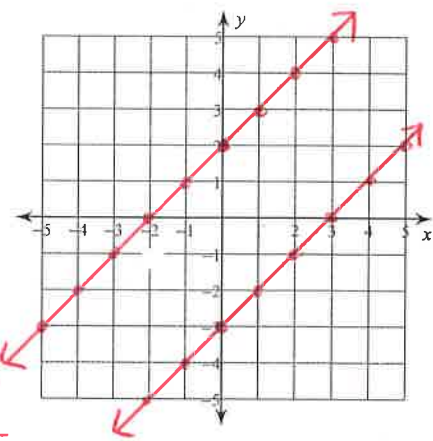


$(-4, -4)$

$$\begin{array}{r} x - 2y = 4 \\ -x \quad -x \\ \hline -2y = -x + 4 \\ -2 \quad -2 \quad -2 \\ \hline y = \frac{1}{2}x - 2 \\ m = \frac{1}{2} \\ b = -2 \end{array}$$

$$\begin{array}{r} 7x - 4y = -12 \\ -7x \quad -7x \\ \hline -4y = -7x - 12 \\ -4 \quad -4 \quad -4 \\ \hline y = \frac{7}{4}x + 3 \end{array}$$

4) $x - y = 3$
 $x - y = -2$



No Solution

$$\begin{array}{r} x - y = 3 \\ -x \quad -x \\ \hline -y = -x + 3 \\ -1 \quad -1 \quad -1 \\ \hline y = x - 3 \\ m = 1 \\ b = -3 \end{array}$$

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

Solve each system algebraically (using substitution or elimination).

$$\begin{aligned} 5) \quad & -10x - y = -27 \\ & -3x + y = -12 \end{aligned}$$

$$(3, -3)$$

$$\begin{array}{r} -13x = -39 \\ -13 \quad -13 \end{array}$$

$$x = 3$$

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

$$-3(3) + y = -12$$

$$\begin{array}{r} -9 + y = -12 \\ y \quad +9 \end{array}$$

$$y = -3$$

$$\begin{aligned} 7) \quad & 6x - 5y = -10 \\ 5) \quad & -8x + 6y = 8 \end{aligned}$$

$$36x - 30y = -60$$

$$-40x + 30y = 40$$

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

$$x = 5$$

$$(5, 8)$$

$$6x - 5y = -10$$

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

$$30 - 5y = -10$$

$$\begin{array}{r} -30 \quad -30 \end{array}$$

$$\begin{array}{r} -5y = -40 \\ -5 \quad -5 \end{array}$$

$$y = 8$$

$$\begin{aligned} 9) \quad & y = -3x - 5 \\ & y = 8x + 17 \end{aligned}$$

$$\begin{array}{r} -3x - 5 = 8x + 17 \\ +3x \quad +3x \end{array}$$

$$(-2, 1)$$

$$\begin{array}{r} -5 = 11x + 17 \\ -17 \quad -17 \end{array}$$

$$-22 = 11x$$

$$\begin{array}{r} 11 \quad 11 \end{array}$$

$$-2 = x$$

$$y = -3x - 5$$

$$y = -3(-2) - 5$$

$$y = 6 - 5$$

$$y = 1$$

$$\begin{aligned} 6) \quad & 3x - y = 16 \\ & y = 3x - 16 \end{aligned}$$

Infinite Many Solutions

$$3x - (3x - 16) = 16$$

$$3x - 3x + 16 = 16$$

$$16 = 16$$

true

$$8) \quad 6x + 5y = 4$$

$$5) \quad 8x - 4y = -16$$

$$24x + 20y = 16$$

$$40x - 20y = -80$$

$$64x = -64$$

$$\begin{array}{r} 64 \quad 64 \end{array}$$

$$x = -1$$

$$(-1, 2)$$

$$6x + 5y = 4$$

$$6(-1) + 5y = 4$$

$$-6 + 5y = 4$$

$$\begin{array}{r} +6 \quad +6 \end{array}$$

$$\frac{5y = 10}{5}$$

$$y = 2$$

$$10) \quad 14x + 4y = 10$$

$$2) \quad -7x - 2y = 0$$

$$-14x - 4y = 0$$

$$14x + 4y = 10$$

$$0 = 10$$

False

No Solution

$$11) \begin{cases} -6x + 4y = 46 \\ -2(-3x + 2y) = 23 \end{cases}$$

$$\begin{array}{r} -6x + 4y = 46 \\ 6x - 4y = -46 \\ \hline 0 = 0 \end{array}$$

$0 = 0$
true

Infinitely Many Solutions

$$12) \begin{cases} -9x + 3y = 30 \\ 6x + 4y = 22 \end{cases}$$

$$\begin{array}{r} -36x + 12y = 120 \\ -18x - 12y = -66 \\ \hline -54x = 54 \end{array}$$

$$\frac{-54x}{-54} = \frac{54}{-54}$$

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

$$\boxed{(-1, 7)}$$

$$\begin{array}{r} 6x + 4y = 22 \\ 6(-1) + 4y = 22 \\ -6 + 4y = 22 \\ +6 \quad +6 \\ \hline 4y = 28 \end{array}$$

$$\frac{4y}{4} = \frac{28}{4}$$

$$\boxed{y = 7}$$

$$13) \begin{cases} -3x - 3y = 0 \\ -3(-8x - 10y) = 10 \end{cases}$$

$$\begin{array}{r} -30x - 30y = 0 \\ 24x + 30y = -30 \\ \hline -6x = -30 \end{array}$$

$$\frac{-6x}{-6} = \frac{-30}{-6}$$

$$\boxed{x = 5}$$

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

$$\begin{array}{r} -3x - 3y = 0 \\ -3(5) - 3y = 0 \\ -15 - 3y = 0 \\ +15 \quad +15 \\ \hline -3y = 15 \end{array}$$

$$\frac{-3y}{-3} = \frac{15}{-3}$$

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

$$14) \begin{cases} 2x + 3y = -6 \\ -7x + 4y = 21 \end{cases}$$

$$\begin{array}{r} 14x + 21y = -42 \\ -14x + 8y = 42 \\ \hline 29y = 0 \end{array}$$

$$\frac{29y}{29} = \frac{0}{29}$$

$$\boxed{y = 0}$$

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

$$\frac{2x}{2} = \frac{-6}{2}$$

$$\boxed{x = -3}$$

$$\boxed{(-3, 0)}$$

$$15) \begin{cases} -5x - 8y = 18 \\ y = -2x + 6 \end{cases}$$

$$-5x - 8(-2x + 6) = 18$$

$$-5x + 16x - 48 = 18$$

$$\begin{array}{r} 11x - 48 = 18 \\ +48 \quad +48 \\ \hline 11x = 66 \end{array}$$

$$\frac{11x}{11} = \frac{66}{11}$$

$$\boxed{x = 6}$$

$$y = -2(6) + 6$$

$$y = -12 + 6$$

$$\boxed{y = -6}$$

$$\boxed{(6, -6)}$$

$$16) \begin{cases} y = 2x + 6 \\ -6x + 3y = 5 \end{cases}$$

$$-6x + 3(2x + 6) = 5$$

$$-6x + 6x + 18 = 5$$

$$18 = 5$$

False

No Solution

- 17) Amanda is selling rolls of wrapping paper for a school fundraiser. She is selling plain wrapping paper for \$8 and holiday wrapping paper for \$17. She sold a total of 32 rolls and made \$391. How many of each did she sell?

x = # of plain paper
 y = # of holiday paper

$$\begin{aligned} -8(x + y) &= -32 \\ 8x + 17y &= 391 \end{aligned}$$

$$\begin{aligned} -8x - 8y &= -256 \\ 8x + 17y &= 391 \end{aligned}$$

$$\frac{9y}{9} = \frac{135}{9}$$

$$y = 15$$

$$x + y = 32$$

$$\begin{aligned} x + 17 &= 32 \\ -15 &-15 \end{aligned}$$

$$x = 17$$

17 plain rolls
 15 holiday rolls

- 18) Ashley is trying to decide between gyms. Workout Plus charges a \$100 initiation fee and then \$30 per month. Finisher Fitness charges no initiation fee and \$55 per month. After how many months will the cost be the same?

x = # of months
 y = total cost

$$y = 30x + 100$$

$$y = 55x$$

$$y = 55x$$

$$y = 55(4)$$

$$y = 220$$

$$\begin{aligned} 30x + 100 &= 55x \\ -30x &-30x \end{aligned}$$

$$\frac{100}{25} = \frac{25x}{25}$$

$$4 = x$$

After 4 months
 the cost will be
 \$220 at both
 Gyms