e. If a customer was charged $2 185, how long did the installation take?

$$C = 110t + 1800$$
$$2185 = 110t + 1800$$
$$2185 - 1800 = 110t + 1800 - 1800$$
$$385 = 110t$$
$$\frac{385}{110} = \frac{110t}{110}$$
$$3.5 = t$$

The installation took 3.5 hours.

Please complete *Lesson 7.1 Explore Your Understanding Assignment* located in *Workbook 7.1* before proceeding to *Lesson 7.2*.

Lesson 7.2: General Form of a Linear Equation

Practice – II

1. Rewrite each of the following equations in general form, $Ax + By + C = 0$.

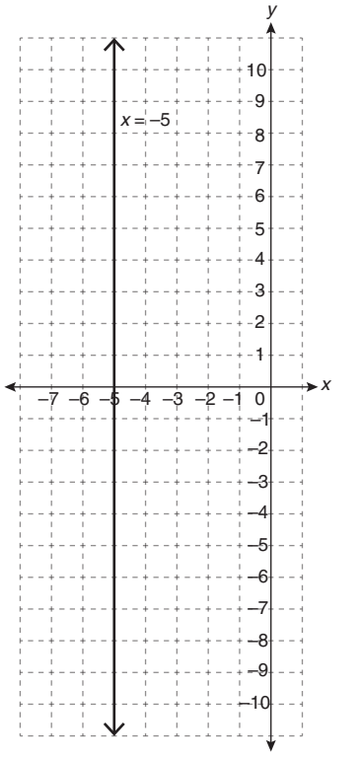
a. $y = -3x - 6$

$$y = -3x - 6$$
$$y + 3x + 6 = -3x - 6 + 3x + 6$$
$$3x + y + 6 = 0$$

b. $y = \frac{2}{3}x - 7$

$$y = \frac{2}{3}x - 7$$
$$y - y = \frac{2}{3}x - 7 - y$$
$$0 = \frac{2}{3}x - y - 7$$
$$3(0) = 3\left(\frac{2}{3}x - y - 7\right)$$
$$0 = 2x - 3y - 21$$

2. Sketch the graph of $x = -5$.



3. The y-axis has can be represented by the equation $x = 0$.

   a. What is the x-intercept of the y-axis?

   0

   b. The line $x = 0$ has an infinite number of y-intercepts. Explain what this means.

   The line $x = 0$ and the y-axis are the same line, so every point on the line is a y-intercept. There are an infinite number of points on each line, so there are an infinite number of y-intercepts.

4. State the equation of a vertical line that passes through the point $(5, -7)$.

   $x = 5$

5. Pravin is planning a garden of tomatoes and pumpkins. His garden has a total area of 300 ft^2. Pravin writes the following equation to represent the number of plants he can include.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$$4t + 25p = 300$$

a. Explain what you expect each term of Pravin's equation to represent.

The $4t$ represents the total area the tomatoes will occupy. If t represents the number of tomato plants, each plant will occupy 4 ft^2. The $25p$ represents the total area the pumpkins will occupy. If p represents the number of pumpkin plants, each plant will occupy 25 ft^2. The 300 represents the total area of the garden, in square feet.

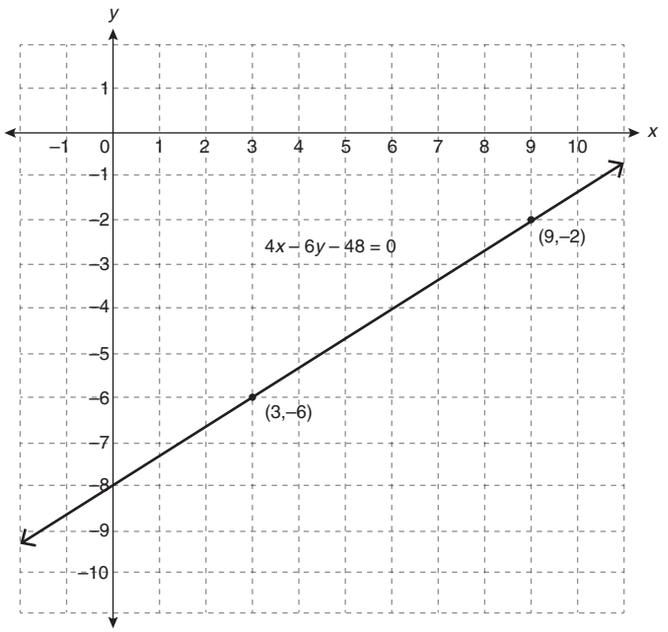
b. If Pravin plans to plant 30 tomato plants, how many pumpkin plants can he use?

$$\begin{aligned} 4t + 25p &= 300 \\ 4(30) + 25p &= 300 \\ 120 + 25p &= 300 \\ 120 + 25p - 120 &= 300 - 120 \\ 25p &= 180 \\ \frac{25p}{25} &= \frac{180}{25} \\ p &= 7.2 \end{aligned}$$

Pravin will be able to plant 7 pumpkin plants in his garden.

6. Ryan says that he can graph a linear relation that is in general form without using x- and y-axis intercepts. Below is his work showing how to graph $4x - 6y - 48 = 0$ using this strategy.

$$\begin{aligned} 4x - 6y - 48 &= 0 \\ 4(3) - 6y - 48 &= 0 \\ 12 - 6y - 48 &= 0 \\ -36 - 6y &= 0 \\ -6y &= 36 \\ y &= -6 \end{aligned} \qquad \begin{aligned} 4x - 6y - 48 &= 0 \\ 4(9) - 6y - 48 &= 0 \\ 36 - 6y - 48 &= 0 \\ -12 - 6y &= 0 \\ -6y &= 12 \\ y &= -2 \end{aligned}$$



a. Explain Ryan's strategy.

Any ordered pair that satisfies the equation of a linear relation will correspond to a point on its graph. By inputting x-values, and solving for y, Ryan determined two such ordered pairs. Once two points on a line are known, the line can be drawn.

b. Give a reason people might prefer to use the intercepts instead of Ryan's method.

Determining the intercepts is a special case of Ryan's strategy. Intercepts tend to be easier to use because substituting 0 for a variable eliminates that term, resulting in a simpler equation.

7. Galaxy High School students want to raise $1 200 to support their student government activities. They sell sweatshirts for a profit of $5.75 and t-shirts for a profit of $3.50.

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   a. Write a linear equation that represents the number of each type of shirt needing to be sold to reach their goal.

      Let s represent the number of sweatshirts sold and let t represent the number of t-shirts sold.

      This means $5.75s$ represents the income from the sweatshirts and $3.5t$ represents the income from the t-shirts. These two expressions can be added to give the total desired income.

      $5.75s + 3.5t = 1\,200$

   b. State the domain and range of the graph of the relation if the students plan to stop selling once they have raised $1 200.

      The minimum number of t-shirts is 0. The maximum number of t-shirts occurs when no sweatshirts are sold.

$$\begin{aligned} 5.75s + 3.5t &= 1\,200 \\ 5.75(0) + 3.5t &= 1\,200 \\ 3.5t &= 1\,200 \\ \frac{\cancel{3.5}t}{\cancel{3.5}} &= \frac{1\,200}{3.5} \\ t &\doteq 342.9 \end{aligned}$$

      The maximum number of t-shirts sold can be 343.

      The minimum number of sweatshirts is 0. The maximum number of sweatshirts occurs when no t-shirts are sold.

$$\begin{aligned} 5.75s + 3.5t &= 1\,200 \\ 5.75s + 3.5(0) &= 1\,200 \\ 5.75s &= 1\,200 \\ \frac{\cancel{5.75}s}{\cancel{5.75}} &= \frac{1\,200}{5.75} \\ s &\doteq 208.7 \end{aligned}$$

      The maximum number of sweatshirts sold can be 209.

      Domain: $\{s \mid 0 \leq s \leq 209, s \in \mathrm{W}\}$ or $[0, 209]$

      Range: $\{t \mid 0 \leq t \leq 343, t \in \mathrm{W}\}$ or $[0, 343]$

      There is no clear independent or dependent variable, so the domain and range can be switched.

Please complete *Lesson 7.2 Explore Your Understanding Assignment* located in *Workbook 7.2* before proceeding to *Lesson 7.3*.