Use Slope-Intercept Vocabulary

● Check Understanding

Possible answer: The equation is linear and the graph is a straight line. Because the equation is written in slope-intercept form, I know that the slope is 20 and the *y*-intercept is 60. The graph begins at the point (0, 60), so it shows the correct *y*-intercept. The slope is $\frac{\text{rise}}{\text{run}}$, or $\frac{20}{1}$. So, for each increase of 1 in *x*, there is an increase of 20 in *y*. The graph goes through the point (1, 80), so it shows the correct slope.

RECORDING SHEET

I can start by looking at the given **linear** equation. I see that it is written as $y = mx + b$, which is in **slope-intercept form**.

I know that *m* is the **slope** and *b* is the ***y*-intercept**.

So, the slope of the given equation is **25** and the *y*-intercept is **50**.

To graph the equation, I can use the *y*-intercept to plot a point on the ***y*-axis**. That point is (0, 50).

Then I can use the slope to plot another point. The slope is the **rise** over the **run**, or $\frac{\text{change in } y}{\text{change in } x}$. The slope is 25, or $\frac{25}{1}$, so for every increase of **1** in *x*, there is an increase of 25 in *y*. That helps me plot another point, (1, 75).

I can draw a **line** through those two points to graph the equation.

●● Check Understanding

Possible answer: I know the slope is 20 and the *y*-intercept is 60. To graph the equation, I can use the *y*-intercept to plot a point on the *y*-axis at (0, 60). I can use the slope to plot another point. The slope is $\frac{\text{rise}}{\text{run}}$. The slope is 20, or $\frac{20}{1}$, so for every increase of 1 in *x*, there is an increase of 20 in *y*. That helps me plot another point, (1, 80). I can draw a line through those two points to graph the equation.

RECORDING SHEET

I can start by looking at the given **linear** equation. I see that it is written as $y = mx + b$, which is in **slope-intercept form**.

So, I know that the **slope** is *m*, the coefficient of the variable *x*. This value represents the constant rate at which Keisha reads, **25** pages per hour.

I also know that the ***y*-intercept** is *b*, the constant term. This value represents how many pages Keisha has already read, **50**.

To graph the equation, I can use the *y*-intercept to plot a point on the ***y*-axis**. That point is (**0**, 50).

Then I can use the slope to plot another point. The slope is the **rise** over the **run**, or $\frac{25}{1}$. So, for every increase of **1** in *x*, there is an increase of 25 in *y*. That helps me plot another point, (1, **75**).

I can draw a **line** through those two points to graph the equation.

Use Slope-Intercept Vocabulary *continued*

Check Understanding

Possible answer: I know the slope is -20 and the y-intercept is 480. To graph the equation, I can use the y-intercept to plot a point on the y-axis at (0, 480). I can use the slope to plot another point. The slope is $\frac{\text{rise}}{\text{run}}$. The slope is -20, or $\frac{-20}{1}$, so for every increase of 1 in x, there is a decrease of 20 in y. That helps me plot another point, (1, 460). I can draw a line through those two points to graph the equation.

RECORDING SHEET

I can start by looking at the given **linear** equation. I see that it is written as $y = mx + b$, which is in **slope-intercept form**. So, I know that the **slope** is m, the coefficient of the variable x. This value represents the **constant rate** at which the number of pages Keisha has left to read decreases, **25** pages per hour. I also know that the ***y*-intercept** is b, the constant term. This value represents the starting number of pages Keisha needs to read, **500**.

To graph the equation, I can use the y-intercept to plot a point on the ***y*-axis**. That point is (0, **500**).

Then I can use the slope to plot another point. The slope is the **rise** over the **run**, or $\frac{-25}{1}$. So, for every increase of **1** in x, there is a **decrease** of 25 in y. That helps me plot another point, (1, **475**).

I can draw a **line** through those two points to graph the equation.

Write an Equation

● Check Understanding

Possible answer:

$15x - 5 = 15x + 5$ has no solutions.

$15x - 5 = 15x + 5$

$15x - 15x = 5 + 5$

$0 \neq 10$

If the coefficient of x is the same on both sides but the constant is different, there will be no solution.

RECORDING SHEET

Check students' work for an understanding of using strategies to write equations with no, one, or infinitely many solutions.

●● Check Understanding

Possible answers:

$15x - 5 = 25$ has one solution.

$15x - 5 = 25$

$15x = 30$

$x = 2$

$15x - 5 = 15x + 5$ has no solutions.

$15x - 5 = 15x + 5$

$15x - 15x = 5 + 5$

$0 \neq 10$

If the coefficient of x is the same on both sides but the constant is different, there will be no solution.

$15x - 5 = 5(3x - 1)$ has infinitely many solutions.

$15x - 5 = 5(3x - 1)$

$15x - 5 = 15x - 5$

$-5 = -5$

If the expressions on each side of the equation are equivalent, there are infinitely many solutions.

RECORDING SHEET

Check students' work for an understanding of using strategies to write equations with no, one, or infinitely many solutions.

●●● Check Understanding

Possible answers:

$\frac{1}{4}(x + 8) = 12$ has one solution.

$\frac{1}{4}(x + 8) = 12$

$x + 8 = 48$

$x = 40$

$\frac{1}{4}(x + 8) = \frac{1}{4}x + 8$ has no solutions.

$\frac{1}{4}(x + 8) = \frac{1}{4}x + 8$

$x + 8 = x + 32$

$8 \neq 32$

If the coefficient of x is the same on both sides but the constant is different, there will be no solution.

$\frac{1}{4}(x + 8) = \frac{1}{4}x + 2$ has infinitely many solutions.

$\frac{1}{4}(x + 8) = \frac{1}{4}x + 2$

$x + 8 = x + 8$

$8 = 8$

If the expressions on each side of the equation are equivalent, there are infinitely many solutions.

RECORDING SHEET

Check students' work for an understanding of using strategies to write equations with no, one, or infinitely many solutions.

Match Scenarios and Systems

● Check Understanding

x represents the number of large pizzas and y represents the number of small pizzas; Possible explanation: The problem states that each large pizza costs \$20 and the second equation in the system shows x multiplied by 20. The problem also states that each small pizza costs \$12 and the equation shows y multiplied by 12.

ACTIVITY ANSWERS

Scenario A; System F; Solution C

Scenario B; System D; Solution E

Scenario C; System E; Solution B

Scenario D; System B; Solution A

Scenario E; System C; Solution F

Scenario F; System A; Solution D

●● Check Understanding

Possible explanation: x = the number of large pizzas, and y = the number of small pizzas. The equation $x + y = 10$ shows that Tara bought a total of 10 large and small pizzas. The equation $20x + 12y = 168$ shows that at \$20 for each large and \$12 for each small, Tara spent a total of \$168 for the pizzas.

The solution of the system is (6, 4), which means Tara bought 6 large pizzas and 4 small pizzas.

ACTIVITY ANSWERS

Scenario A; System F; Solution C

Scenario B; System D; Solution E

Scenario C; System E; Solution B

Scenario D; System B; Solution G

Scenario E; System H; Solution A

Scenario F; System A; Solution H

Scenario G; System C; Solution F

Scenario H; System G; Solution D

●●● Check Understanding

$$x + y = 10$$
$$20x + 12y = 168$$

Possible explanation: x = the number of large pizzas, and y = the number of small pizzas. The equation $x + y = 10$ shows that Tara bought a total of 10 large and small pizzas. The equation $20x + 12y = 168$ shows that at \$20 for each large and \$12 for each small, Tara spent a total of \$168 for the pizzas.

The solution of the system is (6, 4), which means Tara bought 6 large pizzas and 4 small pizzas.

ACTIVITY ANSWERS

Scenario A; Equations F and I; Solution C

Scenario B; Equations D and O; Solution E

Scenario C; Equations E and (L or M); Solution B

Scenario D; Equations B and (J or P); Solution G

Scenario E; Equations H and (J or P); Solution A

Scenario F; Equations A and N; Solution H

Scenario G; Equations C and K; Solution F

Scenario H; Equations G and (L or M); Solution D