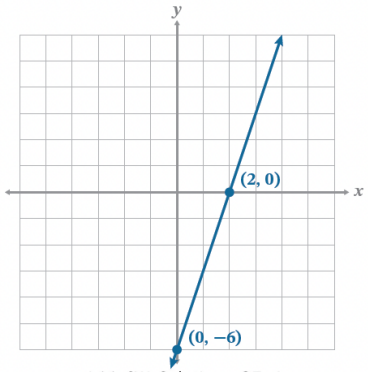
Part A: Standard Form

Practice 1

1.

$3a - 0 = 6$
$3a = 6$
$a = 2$
$(2, 0)$

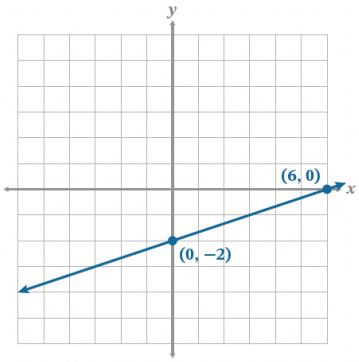
$3(0) - b = 6$
$-b = 6$
$b = -6$
$(0, -6)$



2.

$a - 3(0) = 6$
$a = 6$
$(6, 0)$

$0 - 3b = 6$
$-3b = 6$
$b = -2$
$(0, -2)$



3.

$5a + 2(0) = 3$
$5a = 3$
$a = \frac{3}{5}$
$(\frac{3}{5}, 0)$

$5(0) + 2b = 3$
$2b = 3$
$b = \frac{3}{2}$
$(0, \frac{3}{2})$

4.

$3a - 0 = -19$
$3a = -19$
$a = \frac{-19}{3}$
$(\frac{-19}{3}, 0)$

$3(0) - b = -19$
$-b = -19$
$b = 19$
$(0, 19)$

5.

$5a - 6(0) = 72$
$5a = 72$
$a = \frac{72}{5}$
$(\frac{72}{5}, 0)$

$5(0) - 6b = 72$
$-6b = 72$
$b = -12$
$(0, -12)$

6.

$10x + 5(0) = 10$
$10x = 10$
$x = 1$ pound of turkey

$10(0) + 5y = 10$
$5y = 10$
$y = 2$ pounds of cheese

7.

$$y - 6 = \frac{2}{7}x - 2$$
$$y = \frac{2}{7}x + 4$$
$$-\frac{2}{7}x + y = 4$$
$$-7(-\frac{2}{7}x + y = 4)$$
$$2x - 7y = -28$$

$A = 2, B = -7, C = -28$

8.

$$\frac{1}{9}x + y = 11$$
$$9\,(\frac{1}{9}x + y = 11)$$
$$x + 9y = 99$$

$A = 1, B = 9, C = 99$

9.

$A = 1, B = -2, C = 4$

$m = -(\frac{A}{B}) = -(\frac{1}{-2}) = \frac{1}{2}$

$b = \frac{C}{B} = \frac{4}{-2} = -2$

10.

$A = 8, B = -5, C = -6$

$m = -(\frac{A}{B}) = -(\frac{8}{-5}) = \frac{8}{5}$

$b = \frac{C}{B} = \frac{-6}{-5} = \frac{6}{5}$

11.

Line a: $m = -\frac{2}{3}$, $b = \frac{6}{3} = 2$

Line b: $m = \frac{2}{3}$, $b = 3$

Line c : $m = -\frac{3}{2}$, $b = 3$

12.

Line c has the smallest slope because it is the farthest to the left on the number line.

13.

Line b and Line c

14.

Line p: $m = -(\frac{1}{-1}) = 1$, $b = -P$

Line q: $m = \frac{-4}{7}$, $b = \frac{Q}{7}$

Line r: $m = -(\frac{6}{-5}) = \frac{6}{5}$, $b = \frac{R}{-5}$

15.

Line r, Line p, Line q

16.

$A = 1$; $B = E$; $C = F$

$m = -(\frac{A}{B}) = -(\frac{1}{E}) = -\frac{1}{E}$

$b = \frac{C}{B} = \frac{F}{E}$

17.

$b = \frac{C}{B}$

18.

$m = -(\frac{A}{B})$

Practice 2

1.

$2a - 0 = 8$

$2a = 8$

$a = 4$

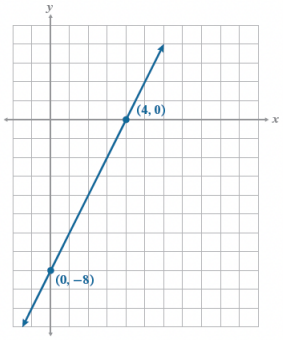
$(4, 0)$

$2(0) - b = 8$

$-b = 8$

$b = -8$

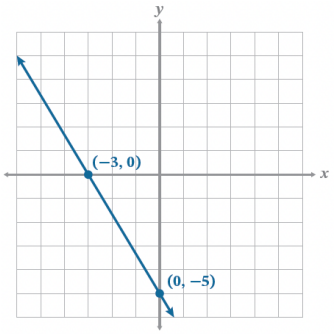
$(0, -8)$



2.

$5a + 3(0) = -15$
$5a = -15$
$a = -3$
$(-3, 0)$

$5(0) + 3b = -15$
$3b = -15$
$b = -5$
$(0, -5)$



3.

$2a + 5(0) = 10$
$2a = 10$
$a = 5$
$(5, 0)$

$2(0) + 5b = 10$
$5b = 10$
$b = 2$
$(0, 2)$

4.

$12a - 5(0) = 30$
$12a = 30$
$a = \frac{5}{2}$
$(\frac{5}{2}, 0)$

$12(0) - 5b = 30$
$-5b = 30$
$b = -6$
$(0, -6)$

5.

$3a + 4(0) = 12$
$3a = 12$
$a = 4$
$(4, 0)$

$3(0) + 4b = 12$
$4b = 12$
$b = 3$
$(0, 3)$

6.

$$5x + 8(0) = 40$$
$$5x = 40$$
$$x = 8 \text{ hot dogs}$$
$$5(0) + 8y = 40$$
$$8y = 40$$
$$y = 5 \text{ hamburgers}$$

7.

$$y = \frac{1}{3}x + 2 - 1$$
$$y = \frac{1}{3}x + 1$$
$$-\frac{1}{3}x + y = 1$$
$$-3\left(-\frac{1}{3}x + y = 1\right)$$
$$x - 3y = -3$$
$$m = \frac{1}{3}, b = 1$$

8.

LCD (2, 3) = 6

$$6\left(\frac{x}{2} + \frac{y}{3} = 1\right)$$
$$3x + 2y = 6$$
$$m = -\left(\frac{A}{B}\right) = -\left(\frac{3}{2}\right) = -\frac{3}{2}$$
$$b = \frac{C}{B} = \frac{6}{2} = 3$$

9.

$$y - \frac{1}{5} = \frac{3}{7}x + \frac{3}{7}$$
$$y = \frac{3}{7}x + \frac{3}{7} + \frac{1}{5}$$
$$-\frac{3}{7}x + y = \frac{15}{35} + \frac{7}{35}$$

LCD (7, 35) = 35

$$-35\left(-\frac{3}{7}x + y = \frac{22}{35}\right)$$
$$15x - 35y = -22$$
$$m = -\left(\frac{A}{B}\right) = -\left(\frac{15}{-35}\right) = \frac{3}{7}$$
$$b = \frac{C}{B} = \frac{22}{35}$$

10.

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

$$-\frac{2}{3}x + y = -\frac{1}{3} + \frac{12}{3}$$

$$-3\left(-\frac{2}{3}x + y = \frac{11}{3}\right)$$

$$2x - 3y = -11$$

$m = \frac{2}{3}$

$b = \frac{C}{B} = \frac{-11}{-3} = \frac{11}{3}$

11.

Line b, Line d, Line a, Line c

Line a	$y - 1 = -2(x - 1)$	$m = -2$, $b = 3$
Line b	$2x - y = 2$	$m = 2$, $b = -2$
Line c	$y = -\frac{4}{3}x + 4$	$m = -\frac{4}{3}$, $b = 4$
Line d	$4x - 3y = -3$	$m = \frac{4}{3}$, $b = 1$

12.

Line b, Line d, Line c, Line a

13.

$m = -E$ and $b = H$

14.

$Ex + y = H$

15.

$E = 15$, $H = 30$, $m = -E = -15$, $b = H = 30$

Part B: Horizontal and Vertical Lines

Practice 1

1.

$m = 0$

2.

$b = 5$

3.

$y = 5$ OR $h(x) = 5$

4.

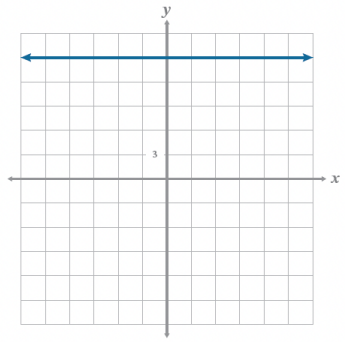
Yes, it passes the Vertical Line Test.

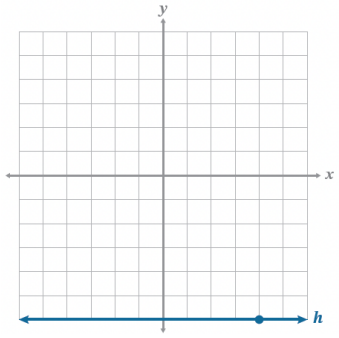
5.
$m = \frac{-2-(-2)}{-5-1} = \frac{0}{-6} = 0$

6.
$y = -2$ or $f(x) = -2$

7.
Yes, the line is horizontal, which means that the x-value can be any number as long as the y-value is -2.

8.
It is horizontal since the slope is zero and all horizontal lines have zero slope.

9.


10.


$y = -6$
Domain: $\{\mathbb{R}\}$
Range: $\{-6\}$

11.
Domain: $\{\mathbb{R}\}$
Range: $\{-9\}$

12.
Sample: She mixed up the x- and y-coordinates. The horizontal line that passes through the point $(-2, -6)$ is $y = -6$.

13.
The slope is undefined.

14.
The y-intercept does not exist.

15.
$x = -4$

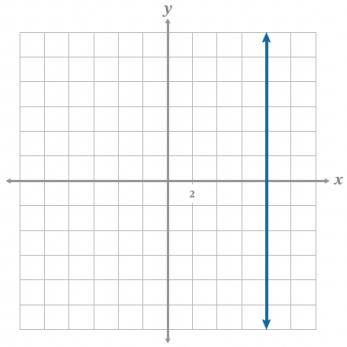
16.
No, it does not pass the Vertical Line Test.

17.
$m = \frac{13-1}{-7-(-7)} = \frac{12}{0}$ = undefined

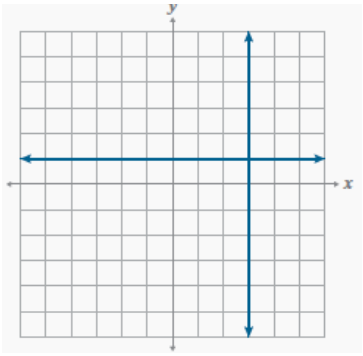
18.
$x = -7$

19.
Sample: No, this is a vertical line, so no matter what the y-value is, the x-value will be -7.

20.
Vertical, since the slope is undefined and all vertical lines have an undefined slope.

21.


22.



$x = 3$
Domain: {3}
Range: {ℝ}

23.
Domain: {−1}
Range: {ℝ}

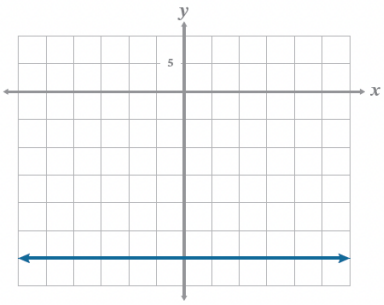
24.
Yes, the x-coordinate is 10, and the equation is $x = 10$.
The vertical and horizontal lines are:
$x = 10$
$y = -7$

Practice 2

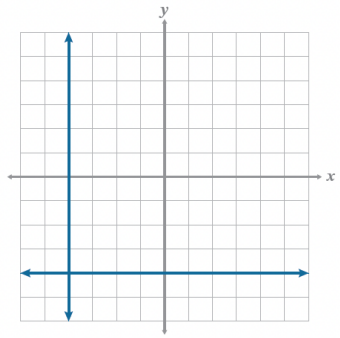
1.
$y = b$

2.
$m = \frac{6-6}{2-(-15)} = \frac{0}{17} = 0$
$y = 6$

3.



4.



5.
$y = -4$

6.
$x = -4$

7.
Domain: $\{\mathbb{R}\}$
Range: $\{7\}$

8.
$g(x) = \frac{1}{2}$

9.
$x = a$

10.
$m = \frac{-5-1}{0-0} = \frac{-6}{0}$ = undefined
$x = 0$
The special name for this line is the y-axis.

11.
$x = 2$
$y = -5$
$(2, -5)$

12.
Domain: $\{\mathbb{R}\}$

13.
$x = -1$
$y = 4$
$(-1, 4)$

14.
Domain: $\{-1\}$

15.
Domain: {−12}
Range: {ℝ}

16.
$x = -30, y = 15$

Targeted Review

Problem	1	2	3	4	5	6	7	8	9	10	11	12	13
Lesson Origin	10	10	10	10	8	9	8	7	7	4	5	10	9

1.

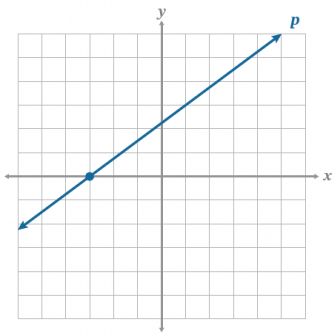
$$m = \frac{5-1}{1-(-2)} = \frac{4}{3}$$
$$y - 5 = \frac{4}{3}(x - 1)$$
$$y - 5 = \frac{4}{3}x - \frac{4}{3}$$
$$y = \frac{4}{3}x + \frac{11}{3}$$

2.
(time, distance)
$m = 6$
$b = -9$
$y = 6x - 9$

3.
The rate of change is 6 feet per second.

4.
It will take Mr. Fred 4 minutes to finish the race.
$$15 = 6x - 9$$
$$24 = 6x$$
$$4 = x$$

5.



6.

$$y - 0 = \frac{3}{4}(x + 3)$$
$$y = \frac{3}{4}(x + 3)$$
OR $y = \frac{3}{4}x + \frac{9}{4}$

7.

$g(x) = b(x) + 3$ OR $g(x) = -\frac{4}{3}x + 3$

Sample: Adding three means that the graph will move up three units.

8.

(week, cost)

$c(w) = 2.50w$

9.

Sample: The domain represents the x-values and is the independent variable. The range represents the y-values and is the dependent variable.

10.

$-19 \leq 6x - 7 < 23$
$-12 \leq 6x < 30$
$-2 \leq x < 5$

11.

1,252 students $(\frac{2\ slices}{1\ student})(\frac{1\ pizza}{8\ slices})$ = 313 pizzas

12. B

A. 6 weeks

B. $6\frac{2}{3}$ weeks

C. 7 weeks

D. 10 weeks

Distractor Rationale:

A and C incorrectly round the correct solution.

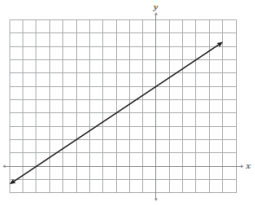
D overestimates the time it will take to pay back the loan.

Elle needs to use the equation $y = 45x - 300$ and set y equal to 0.

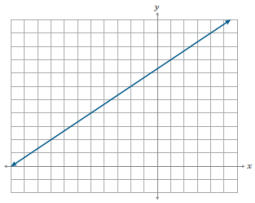
$$y = 45x - 300$$
$$0 = 45x - 300$$
$$300 = 45x$$
$$x = \frac{300}{45} = 6\frac{2}{3}$$

13. B

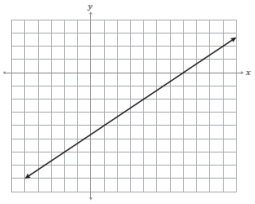
A)



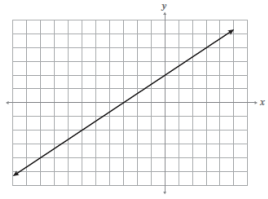
B)



C)



D)



Distractor Rationale:
A. This graphs the point (−6, 2) rather than (−2, 6).
C. This graphs the point (−2, −6).
D. This graphs the point (−6, −2).