DOOR

Promethean Board

2/28

Period 2 - Pre-Algebra

Landon V. Mathew | Auralia Landon H. | De'Marion Connor Y. | Emily F. Andrew

Haley Azalea

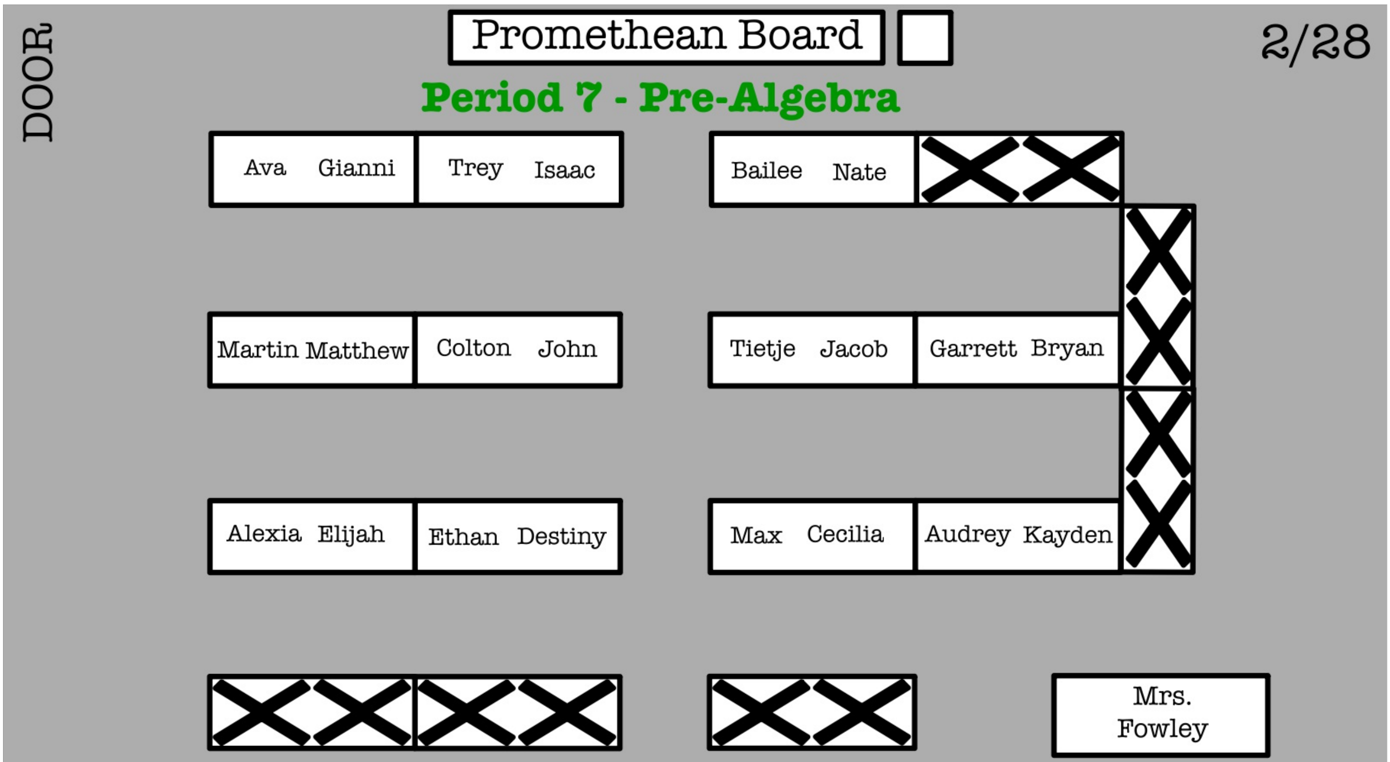
Rylee Lilly | James Haiden | Mercy Rhiannon | Regan David

Bailey Tyler G.

Riley Emma | Lily Emily J. | Leah Tyler K. | Jacob Raevyn

Tatyana | Connor F. Kathryn | Hope | Mrs. Fowley

1. Check 8.6 Exercises
2. 8.7 notes discussion & Exercises Pp.429-430
3. Homework: More 8.7 Exerises and
   8.8 Systems and Linear Equations notes Pp.431-433



1. Check 8.6 Exercises
2. 8.7 notes discussion & Exercises Pp.429-430
3. Homework: More 8.7 Exerises and
   8.8 Systems and Linear Equations notes Pp.431-433

8.6 Exercises #11, 13, 15, 19, 23, & 27 2/27

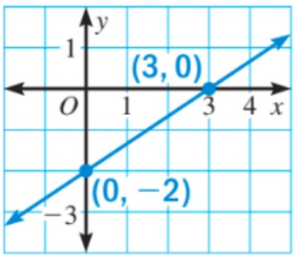
Write an equation of the line with the given slope and *y*-intercept.

11. slope = -1; y-intercept = -20

$y = -x - 20$

Write an equation of the line.

13.



$y = \frac{2}{3}x - 2$

Write an equation of the line through the given points.

15. (0, 9), (3, 15)

$y = 2x + 9$

$\frac{15-9}{3-0} = \frac{6}{3} = 2$

Write an equation of the line that is parallel to the given line and passes through the given point.

19. $y = -x - 3$; (0, 7)

$y = -x + 7$

Write an equation of the line that is perpendicular to the given line and passes through the given point.

23. $y = -\frac{1}{4}x + 3$; (0, 1)

$y = 4x + 1$

Write a direct variation equation that has (4, 20) as a solution.

$y = kx$ **Write general equation for direct variation.**

$20 = k(4)$ **Substitute 4 for *x* and 20 for *y*.**

$5 = k$ **Divide each side by 4.**

Answer A direct variation equation is $y = 5x$.

Two variables *x* and *y* show *direct variation* if $y = kx$ for some nonzero number *k*. In Exercises 27–30, write a direct variation equation that has the given ordered pair as a solution.

27. (5, 15) $y = 3x$

$$\frac{15}{5} = \frac{k(5)}{5}$$

$$3 = k$$

$$y = 3x$$

When you use an equation to represent a function, it is often convenient to give the function a name, such as f or g. For instance, the function $y = x + 2$ can be written in **function notation** as follows:

$$f(x) = x + 2$$

The symbol $f(x)$, which replaces y, is read "f of x" and represents the value of the function f at x. For instance, $f(3)$ is the value of f when $x = 3$.

Example 1 *Working with Function Notation*

Let $f(x) = -3x + 8$. Find $f(x)$ when $x = 5$, and find x when $f(x) = -22$.

a. $f(x) = -3x + 8$ **Write function.**

$f(5) = -3(5) + 8$ **Substitute 5 for x.**

$= -7$ **Simplify.**

Answer When $x = 5$, $f(x) = -7$.

b. $f(x) = -3x + 8$ **Write function.**

$-22 = -3x + 8$ **Substitute -22 for $f(x)$.**

$-30 = -3x$ **Subtract 8 from each side.**

$10 = x$ **Divide each side by -3.**

Answer When $f(x) = -22$, $x = 10$.

Graphing Functions To graph a function written in function notation, you may find it helpful to first rewrite the function in terms of x and y.

Example 2 *Graphing a Function*

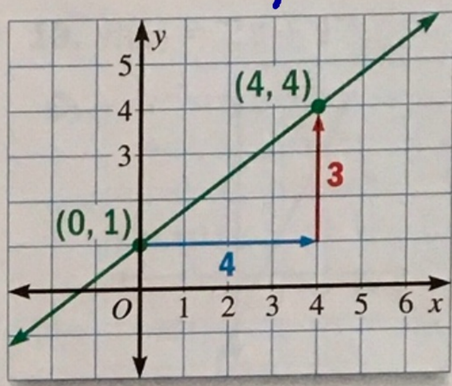
Graph the function $f(x) = \frac{3}{4}x + 1$. $\underbrace{f(0)}_{y} = \frac{3}{4}\underbrace{(0)}_{x} + 1 = \underbrace{1}_{y}$

1) Rewrite the function as $y = \frac{3}{4}x + 1$.

2) The y-intercept is 1, so plot the point (0, 1).

3) The slope is $\frac{3}{4}$. Starting at (0, 1), plot another point by moving right 4 units and up 3 units.

4) Draw a line through the two points.



If $f(c) = d$ for a function f, then you can conclude that the graph of f passes through the point (c, d).

Example 3 — *Writing a Function* $g(x)$

Write a linear function g given that $g(\underset{x}{0}) = \underset{y}{9}$ and $g(\underset{x}{3}) = \underset{y}{-6}$.

1) Find the slope m of the function's graph. From the values of $g(0)$ and $g(3)$, you know that the graph of g passes through the points $(0, 9)$ and $(3, -6)$. Use these points to calculate the slope.

$$m = \frac{-6 - 9}{3 - 0} = \frac{-15}{3} = -5$$

2) Find the y-intercept b of the function's graph. The graph passes through $(0, 9)$, so $b = 9$.

3) Write an equation of the form $g(x) = mx + b$.

$$g(x) = -5x + 9$$

Example 4 *Using Function Notation in Real Life*

After the balloon described on page 426 was launched, it rose at a rate of about 500 feet per minute to a final altitude of 120,000 feet.

a. Use function notation to write an equation giving the altitude of the balloon as a function of time.

b. How long did it take the balloon to reach its final altitude?

Solution

a. Let t be the elapsed time (in minutes) since the balloon was launched, and let $a(t)$ be the altitude (in feet) at that time. Write a verbal model. Then use the verbal model to write an equation.

Altitude = Rate of climb • Time since launch

$$a(t) = 500t$$

b. Find the value of t for which $a(t) = 120{,}000$.

$a(t) = 500t$	**Write function for altitude.**
$120{,}000 = 500t$	**Substitute 120,000 for $a(t)$.**
$240 = t$	**Divide each side by 500.**

Answer It took the balloon about 240 minutes (or about 4 hours) to reach its final altitude.

8.7 Exercises Pp.429-430 2/28

Let $f(x) = -3x + 1$ and $g(x) = 10x - 4$. Find the indicated value.

12. $g(x)$ when $x = 5$

$g(5) = 10(5) - 4$

$g(5) = 50 - 4$

$\boxed{g(5) = 46}$

14. x when $g(x) = 31$

$31 = 10x - 4$

$+4 \qquad +4$

$35 = 10x$

$\frac{35}{10} = \frac{10x}{10}$

$\boxed{3.5 = x}$

16. $f(4) + g(-3)$

$f(4) = -3(4) + 1$

$f(4) = -11$ *

$g(-3) = 10(-3) - 4$

$g(-3) = -34$ *

$-11 + (-34)$

$\boxed{-45}$

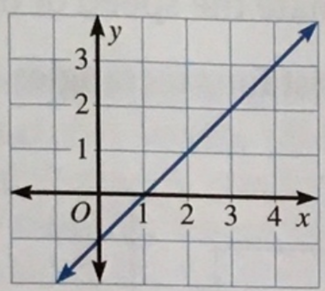
Match the function with its graph.

17. $f(x) = 2x - 1$ C

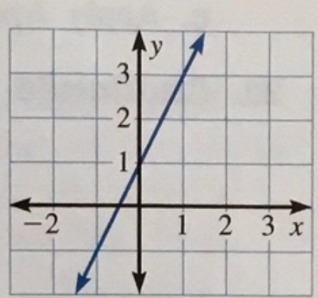
18. $g(x) = x - 1$ A

19. $h(x) = 2x + 1$ B

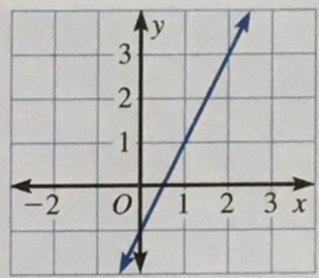
A.



B.

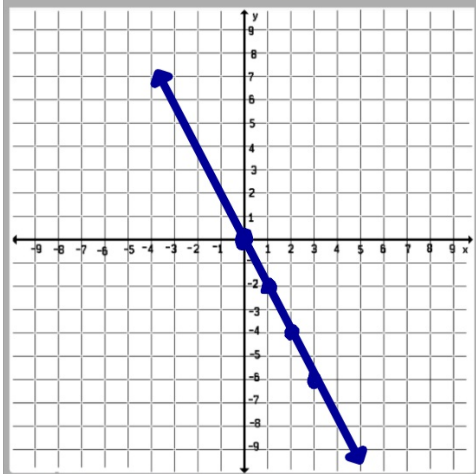


C.

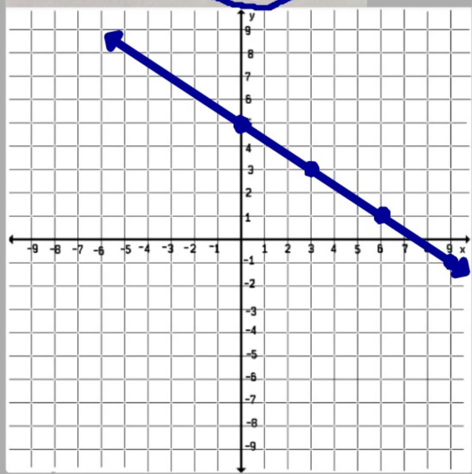


Graph the function.

20. $f(x) = -2x$



22. $h(x) = -\frac{2}{3}x + 5$



Write a linear function that satisfies the given conditions.

24. $f(0) = 4, f(1) = 7$

x y x y

$(0, \underline{4})$ and $(1, 7)$

b

$\frac{7-4}{1-0} = \frac{3}{1} = 3 = m$

$\boxed{f(x) = 3x + 4}$

26. $h(0) = 13, h(3) = 1$

$(0, \underline{13})$ and $(3, 1)$

b

$\frac{1-13}{3-0} = \frac{-12}{3} = -4 = m$

$\boxed{h(x) = -4x + 13}$

$(3,1)\ (4,-3)$

$$\frac{-3-1}{4-3} = \frac{-4}{1} = -4 = m$$

$y = -4x + b$

$1 = -4(3) + b$

$1 = -12 + b$

$+12 \quad +12$

$13 = b$

$-3 = -4(4) + b$

$-3 = -16 + b$

$\underline{+16} \quad \underline{+16}$

$13 = b$

$y = -4x + 13$

28. Squid An arrow squid has a beak used for eating. Given the length b (in millimeters) of an arrow squid's lower beak, you can approximate the squid's mass (in grams) using the function $m(b) = 236b - 513$.

a. The beak of an arrow squid washes ashore on a beach, where it is found and measured by a biologist. The lower beak has a length of 5 millimeters. Approximate the mass of the squid.

$$m(5) = 236(5) - 513$$

$$1{,}180 - 513 = \boxed{667\text{ g}}$$

b. To the nearest tenth of a millimeter, about how long is the lower beak of an arrow squid with a mass of 1100 grams?

$$1100 = 236b - 513$$
$$+513 \qquad\qquad +513$$
$$\frac{1613}{236} = \frac{236b}{236}$$

$$\boxed{b \approx 6.8\text{ mm}}$$

$$\begin{array}{r} 6.8 \\ 236\overline{)1613.00} \\ -1416\downarrow \\ 1970 \\ -1888 \\ 820 \end{array}$$

8.7 Exercises #13, 15, 21, & 27 2/28

8.8 Systems and Linear Equations notes Pp.431-433 2/28