

In Exercises 1–3, write an equation of the line with the given slope and y-intercept.

1. slope: 3

y-intercept: -9

$$y = 3x - 9$$

2. slope: 0

y-intercept: $\frac{1}{3}$

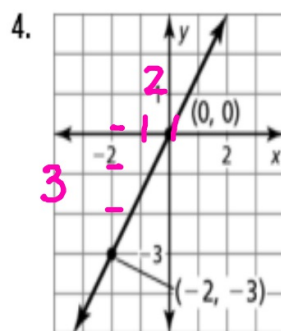
$$y = \frac{1}{3}$$

3. slope: $-\frac{2}{5}$

y-intercept: 7

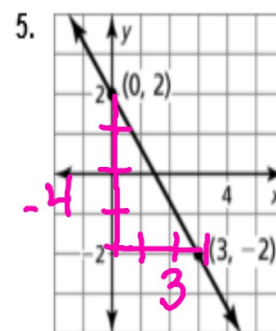
$$y = -\frac{2}{5}x + 7$$

In Exercises 4 and 5, write an equation of the line in slope-intercept form.



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

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



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

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

In Exercises 6–8, write an equation of the line that passes through the given points.

6. $(4, 0), (0, -7)$

7. $(0, -3), (-2.5, 2)$

8. $(0, 4), (-6, 1.5)$

Slope = $\frac{\text{Rise}}{\text{Run}}$

$$\frac{-3 - 2}{0 - (-2.5)} = \frac{-5}{2.5}$$

$$\frac{4 - 1.5}{0 - (-6)} = \frac{2.5}{6}$$

change y $\frac{0 - (-7)}{4 - 0} = \frac{7}{4}$

$$y = -2x - 3$$

$$y = \frac{2.5}{6}x + 4$$

$$y = \frac{7}{4}x - 7$$

$$y = \frac{5}{12}x + 4$$

In Exercises 9–11, write a linear function f with the given values.

9. $f(6) = -2, f(0) = -5$ 10. $f(0) = -1, f(2) = -1$ 11. $f(-4) = 3, f(0) = -2$

$$(6, -2) \quad (0, -5)$$

$$f(x) = 1$$

$$f(x) = -\frac{5}{4}x - 2$$

$$\frac{-2 + 5}{6 - 0} = \frac{3}{6} = \frac{1}{2}$$

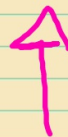
$$f(x) = \frac{1}{2}x - 5$$

12. A T-shirt design company charges your team an initial fee of \$25 to create the team's design. Each T-shirt printed with your design costs an additional \$8.
- Write a linear model that represents the total cost of purchasing your team's T-shirts with your design as a function of the number of T-shirts.
 - Your team has 35 members. If a T-shirt is purchased for every member, what would be the cost?

8 \rightarrow slope

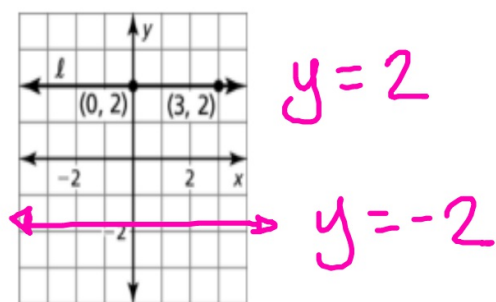
\$25 \rightarrow y-int

$$f(x) = 8x + 25$$



$$f(35) = 8(35) + 25 = \$305$$

13. Line ℓ is a reflection in the x -axis of line k . Write an equation that represents line k .



In Exercises 1–3, write an equation in point-slope form of the line that passes through the given point and has the given slope.

1. ^{x y} $(-4, 5); m = 1$

2. $(3, 4); m = \frac{1}{3}$

3. $(2, -6); m = -\frac{1}{4}$

$$y - y_1 = m(x - x_1)$$

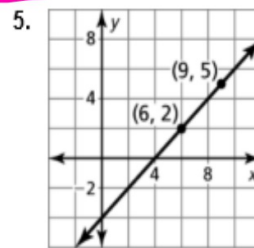
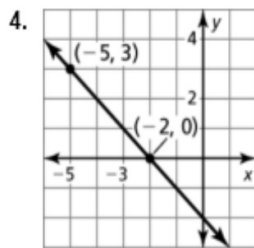
$$y - 5 = 1(x - -4)$$

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

$$y - 4 = \frac{1}{3}(x - 3)$$

$$y + 6 = -\frac{1}{4}(x - 2)$$

In Exercises 4 and 5, write an equation in slope-intercept form of the line shown.



Slope
y-int

In Exercises 6–8, write an equation in slope-intercept form of the line that passes through the given points.

6. $(-3, 6), (-5, -6)$

7. $(2, -4), (5, -4)$

8. $(-7, 18), (7, 14)$

$$\textcircled{1} \frac{6 - (-6)}{-3 - (-5)} = \frac{12}{2} = 6$$

$$y - 6 = 6(x - (-3))$$

$$y - 6 = 6(x + 3)$$

$$y - 6 = 6x + 18$$

$$y = 6x + 24$$

$$\frac{-4 - (-4)}{2 - 5} = \frac{0}{-3}$$

$$y - (-4) = 0(x - 2)$$

$$y + 4 = 0$$

$$y = -4$$

$$\frac{18 - 14}{-7 - 7} = \frac{4}{-14}$$

$$y - 18 = -\frac{2}{7}(x - (-7))$$

$$y - 18 = -\frac{2}{7}(x + 7)$$

$$y - 18 = -\frac{2}{7}x - 2$$

$$y = -\frac{2}{7}x + 16$$

In Exercises 9–11, write a linear function f with the given values.

9. $f(-5) = 2, f(7) = -4$ 10. $f(-2) = 1, f(12) = 7$ 11. $f(-8) = 12, f(-3) = -3$

$(-5, 2)$	$(7, -4)$	$(-2, 1)$	$(12, 7)$	$(-8, 12)$	$(-3, -3)$
$\frac{2 - (-4)}{-5 - 7} = \frac{6}{-12} = -\frac{1}{2}$	$\frac{1 - 7}{-2 - 12} = \frac{-6}{-14} = \frac{3}{7}$	$\frac{12 - (-3)}{-8 - (-3)} = \frac{15}{-5}$			
$y - 2 = -\frac{1}{2}(x - (-5))$	$y - 1 = \frac{3}{7}(x - (-2))$	$y - 12 = -3(x + 8)$			
$y - 2 = -\frac{1}{2}(x + 5)$	$y - 1 = \frac{3}{7}(x + 2)$	$y - 12 = -3x - 24$			
$y - 2 = -\frac{1}{2}x - 2.5$	$y - 1 = \frac{3}{7}x + \frac{6}{7}$	$+12 \qquad +12$			
$+2 \qquad +2$	$+1 \qquad +1$	$y = -3x - 12$			
$y = -\frac{1}{2}x - 0.5$	$y = \frac{3}{7}x + \frac{13}{7}$				

In Exercises 12 and 13, tell whether the data in the table can be modeled by a linear equation. Explain. If possible, write a linear equation that represents y as a function of x .

12.

x	0	1	2	3	4
y	3.5	3	2.5	2	1.5

-0.5

Linear: Rate of change is constant

$$y = -0.5x + 3.5$$

13.

x	0	2	4	6	8
y	1	2	4	8	16

1 2 4 8

No Rate of Change is not constant

14. The equation $y - 2 = \frac{5}{4}(x + 8)$ represents the cost (in dollars) of making your own juice (in fluid ounces).

- What is the slope of the line? Interpret the slope in the context of this situation.
- Write the equation as a linear function.
- Use the linear function in part (b) to determine the base cost of making your own juice.

a.) $\frac{5}{4}$; \$5 for 4 fl oz of juice

b.) $f(x) = \frac{5}{4}x + 12$

c.) \$12