

Warm Up

September 24, 2018

1.) Write the equation of a line with :

A. a slope of 0 and y-intercept of 5. $y = 5$

B. a slope of $\frac{3}{4}$ and a y-intercept of 0. $y = \frac{3}{4}x$

C. a slope of $-\frac{1}{2}$ and a y-intercept of -7. $y = -\frac{1}{2}x - 7$

$$P = 4s$$

2.) Find the perimeter of square with a side length of $4x + 2$.

$$4(4x + 2) = 16x + 8$$

3.) What is the rate of change for the function $f(x) = 2.1x - 6$ over the interval $[13, 25]$? $\rightarrow [a, b]$

$$\frac{f(b) - f(a)}{b - a} \rightarrow 2.1$$

$$\frac{f(25) - f(13)}{25 - 13} = \frac{46.5 - 21.3}{12} = \frac{25.2}{12}$$

$$2.1(25) - 6$$

WRITING LINEAR EQUATIONS

(Given a Point and Slope)

To write the equation of the line passing through point (x_1, y_1) with slope (m) , you can use the point-slope formula:

Point-Slope Formula:

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

Be sure to distribute and solve for y !

Point-Slope (x_1, y_1)

1. $(4, 1)$; slope = 2

$$\begin{aligned} y - 1 &= 2(x - 4) \\ y - 1 &= 2x - 8 \\ +1 &\quad +1 \\ \hline y &= 2x - 7 \end{aligned}$$

Slope-Intercept Form

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

$$\begin{aligned} y &= mx + b \\ 4 &= \frac{1}{2}(2) + b \\ 4 &= 1 + b \\ b &= 3 \\ y &= \frac{1}{2}x + 3 \end{aligned}$$

(x_1, y_1)

3. $(-6, 0)$; slope = $\frac{2}{3}$

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

$$y - 0 = \frac{2}{3}(x + 6)$$

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

4. $(-8, -1)$; slope = $-\frac{3}{4}$

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

$$y + 1 = -\frac{3}{4}(x + 8)$$

$$y + 1 = -\frac{3}{4}x - 6$$

$$y = -\frac{3}{4}x - 7$$

5. (4, -3); slope = -1

$$y = mx + b$$

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

$$-3 = -4 + b$$

$$\begin{array}{r} +4 \quad +4 \\ \hline \end{array}$$

$$1 = b$$

$$y = -x + 1$$

6. (0, -9); slope = 4

$$y = 4x - 9$$

Main Ideas/Questions

Notes/Examples

WRITING LINEAR EQUATIONS

(Given Two Points)

To write a linear equation that passes through two points, (x_1, y_1) and (x_2, y_2) , use the slope formula followed by the point-slope formula:

Slope Formula

$$m = \frac{y_2 - y_1}{x_2 - x_1}$$

Point-Slope Formula

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

1. $(-3, 7)$ and $(1, -1)$

$$m = \frac{-1 - 7}{1 - (-3)} = \frac{-8}{4}$$

$$m = -2$$

$$y - 7 = -2(x + 3)$$

$$y - 7 = -2x - 6$$

$$y = -2x + 1$$

2. $(-6, -7)$ and $(3, -4)$

$$m = \frac{-4 - (-7)}{3 - (-6)} = \frac{3}{9}$$

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

$$y + 7 = \frac{1}{3}(x + 6)$$

$$y + 7 = \frac{1}{3}x + 2$$

$$y = \frac{1}{3}x - 5$$

3. $(2, -1)$ and $(4, -6)$

4. $(1, 6)$ and $(2, 5)$

Challenge!

Which of the following linear equations has the greater y-intercept: the line containing the points (10, 20) and (15, 50) or the line containing the points (10, 20) and (15, 51)?

Explain.

$$= \frac{50-20}{15-10} = \frac{30}{5} = 6$$

$$\begin{aligned} y-20 &= 6(x-10) \\ y-20 &= 6x-60 \\ y &= 6x-40 \end{aligned}$$

$$= \frac{51-20}{15-10} = \frac{31}{5} = 6.2$$

$$\begin{aligned} y-20 &= 6.2(x-10) \\ y-20 &= 6.2x-62 \\ y &= 6.2x-42 \end{aligned}$$

$$(10, 20) (15, 50)$$

The mass of a package of 50 mints, including the container, is 131 grams. If half of the mints are removed, the total mass is 81 grams. If x is the mass of one mint and y is the total mass, what linear function describes the total mass?

$$(50, 131) (25, 81)$$

$$m = \frac{81-131}{25-50} = \frac{-50}{-25} = 2$$

$$\begin{aligned} y-81 &= 2(x-25) \\ y-81 &= 2x-50 \\ +81 \quad +81 \\ \hline y &= 2x+31 \end{aligned}$$

Each mint weighs 2 grams.
The container weighs 31 grams.