

Algebra 1A

Lesson 5.2

Use Linear Equations in Slope-Intercept Form

Warm-Up

Write an equation of the line passing through the 2 points.

(a) (0,4) and (2,8)

$$m = \frac{8-4}{2-0} = \frac{4}{2} = 2$$

$$y = 2x + 4$$

(b) (0,-2) and (6,7)

$$m = \frac{7-(-2)}{6-0} = \frac{9}{6} = \frac{3}{2}$$

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

KEY CONCEPT

For Your Notebook

Writing an Equation of a Line in Slope-Intercept Form

STEP 1 Identify the slope m . You can use the slope formula to calculate the slope if you know two points on the line.

STEP 2 Find the y -intercept. You can substitute the slope and the coordinates of a point (x, y) on the line in $y = mx + b$. Then solve for b .

STEP 3 Write an equation using $y = mx + b$.

Example 1. Write an Equation Given the Slope and a Point.

Write an equation of the line that passes through the point (6,3) and has a slope of 2. Then graph it.

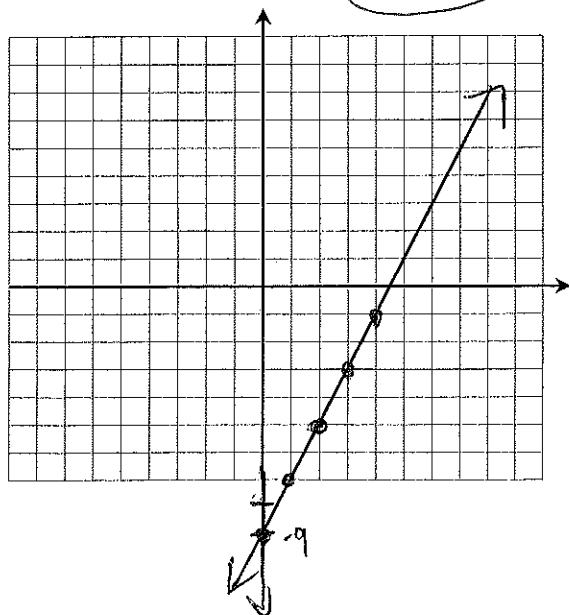
$$m = 2$$

$$b = ?$$

$$y = 2x + b$$
$$3 = 2(6) + b$$
$$-12 \quad -12$$

$$b = -9$$

$$y = 2x - 9$$



Example 2. Write an Equation Given Two Points.

(a) Write the equation of the line that passes through (1,-2) and (-5,4).

$$m = \frac{4 - (-2)}{-5 - 1} = \frac{6}{-6} = -1$$

$$y = -x - 1$$

$$y = -x + b$$

$$-2 = -1(1) + b$$

$$-2 = -1 + b$$

$$-2 + 1 \quad +1 \quad +1$$

$$b = -1$$

(b) Write an equation for the linear function with the values $f(-2) = 10$ and $f(4) = -2$.

$$m = \frac{-2 - 10}{4 - (-2)} = \frac{-12}{6} = -2$$

$$f(x) = -2x + 6$$

$$(-2, 10) \quad (4, -2)$$

$$y = -2x + b$$

$$10 = -2(-2) + b$$

$$10 = 4 + b$$

$$-4 \quad -4$$

$$b = 6$$

Example 3. Story Problem.

A gym charges \$35 per month after an initial membership fee. A member has paid a total of \$250 after 6 months. Write an equation that gives the total cost of a gym membership as a function of the length of membership (in months). Then find the total cost of membership after 10 months.

$$m = \$35/\text{MONTH}$$

$$b = \text{INITIAL MEMBERSHIP FEE}$$

$$\$40$$

$$y = mx + b$$

$$C = ml + b$$

$$C = 35l + b$$

$$250 = 35(6) + b$$

$$C = 35l + 40$$

$$250 = 210 + b$$

$$-210 \quad -210$$

$$b = 40$$

Homework:

New Assignment: Pg. 296 #6-30 (every other even), 43, 49

Review Assignment:

Solve.

1. $2(x - 10) = 2x - 20$

2. $3x + 15 - 10 = 3(x + 3) - 5$

$$C = 35(10) + 40$$

$$C = 390$$

THE COST OF A MEMBERSHIP FOR 10 MONTHS IS \$390

Find the x and y intercepts of the following equation.

3. $y = 4x - 8$