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$y = mx + b$

$y = 0x + 8$

$x = -2$

Writing Linear Equations Using Two Points

CHAPTER 5 SECTION 3

Writing an Equation Using Two Points

- Steps:
  - Find the slope between the two points using $m = \frac{y_2 - y_1}{x_2 - x_1}$
  - Plug the slope into the equation y=mx+b
  - Choose one of the points to plug in for x and y
  - Find b
  - Rewrite the Equation in slope-intercept form

Example:

- Given two points: (1,6) and (3,-4)
- Write a linear equation:

$$m = \frac{y_2 - y_1}{x_2 - x_1} \rightarrow m = \frac{-4-6}{3-1} = \frac{-10}{2} = -5$$

$$y = mx + b \rightarrow y = -5x + b \rightarrow 6 = -5(1) + b$$

$$b = 11$$

$$y = -5x + 11$$

Examples:

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

$m = \frac{4-6}{3-1} = \frac{-2}{2} = -1$

$y = mx + b$

$6 = -1(1) + b$

$6 = -1 + b$

$+1 \quad +1$

$7 = b$

$y = -1x + 7$

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

$m = \frac{3-(-2)}{-4-6} = \frac{5}{-10} = \frac{-1}{2}$

$y = mx + b$

$-2 = -\frac{1}{2}(6) + b$

$-2 = -3 + b$

$+3 \quad +3$

$1 = b$

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

Examples:

- 3. (-1,5) and (3,-3)

$$m = \frac{-3-5}{3+1} = \frac{-8}{4} = -2$$

$y = mx + b$

$5 = -2(-1) + b$

$5 = 2 + b$

$-2 \quad -2$

$3 = b$

$y = -2x + 3$

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

$$m = \frac{6-7}{4-3} = \frac{-1}{1} = -1$$

$y = mx + b$

$7 = -1(3) + b$

$7 = -3 + b$

$+3 \quad +3$

$10 = b$

$y = -1x + 10$

Examples:

- 5. (6,5) and (8,15)

$m = \frac{15-5}{8-6} = \frac{10}{2} = 5$

$y = mx + b$

$5 = 5(6) + b$

$5 = 30 + b$

$-30 \quad -30$

$-25 = b$

$y = 5x - 25$

- 6. (3,-4) and (1,7)

$m = \frac{7-(-4)}{1-3} = \frac{11}{-2} = -5.5$

$y = mx + b$

$7 = -5.5(1) + b$

$7 = -5.5 + b$

$+5.5 \quad +5.5$

$12.5 = b$

$y = -5.5x + 12.5$

Class Work

- Blue book- page 151 # 1-9, 11

(1) $y = mx + b$

$4 = -\frac{1}{2}(2) + b$

$4 = -1 + b$

$+1 \quad +1$

$5 = b$

$y = -\frac{1}{2}x + 5$

(5) $m = 0$

$y = mx + b$

$6 = 0 \cdot 2 + b$

$6 = b$

$y = 0x + 6$

$\boxed{y = 6}$

Closure

- Write on a piece of Paper
  - 1. How to find equation of a line when given slope and y-intercept
  - 2. How to find equation of a line given slope and a point
  - 3. Find equation of a line given two points
  - 4. How to find an equation of a line that is parallel to another

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Homework

- Page 288 # 9-17 odd, 18-20