

## 1-4 WRITING LINEAR EQUATIONS

$$y = mx + b$$

All final answers will appear in this form.

Example:  $y = -3x + 12$

$$m = \underline{\hspace{2cm}} \quad b = \underline{\hspace{2cm}}$$

$$x = \underline{\hspace{2cm}} \quad y = \underline{\hspace{2cm}}$$

- 1) Find the slope
  - a) with the slope formula
  - b) by solving for y in the given equation
  - c) by looking at the graph
- 2) Find the y – intercept
  - a) by plugging x & y coordinates in
  - b) by looking at the graph
- 3) Write the equation

Examples:

1) slope =  $\frac{2}{3}$  Equation:  $y = \frac{2}{3}x - 8$   
 y-int. = -8 (yes, this was too easy!)

2) slope = -3 Equation:  $y = -3x + 7$

passes thru (4, -5)

$$y = -3x + b \text{ now plug in } (4, -5)$$

$$-5 = -3(4) + b, \text{ solve for } b$$

$$-5 = -12 + b \text{ add } 12$$

$$7 = b \text{ write the final ans.}$$

$$y = -3x + 7$$

3) passes thru (1, 9) & (3, -1) Equation:  $y = -5x + 14$

1) find the slope!

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

$$\frac{-1 - 9}{3 - 1} = \frac{-10}{2} = -5$$

$$m = -5$$

$y = -5x + b$  plug in either pt.

$$9 = -5(1) + b$$

$$9 = -5 + b$$

$$b = 14$$

$$\text{Final ans: } y = -5x + 14$$

4) Is parallel to the line with equation  $4y = 2x - 11$  and passes thru (-6, 2) Equation:  $y = \frac{1}{2}x + 5$

1) find the slope!

$$4y = 2x - 11$$

$$y = \frac{2}{4}x - \frac{11}{4}$$

$$y = \frac{1}{2}x - \frac{11}{4}$$

$$m = \frac{1}{2}$$

$y = \frac{1}{2}x + b$  now plug in (-6, 2)

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

$$2 = -3 + b$$

$$b = 5$$

$$\text{Final ans: } y = \frac{1}{2}x + 5$$

5) Is perpendicular to the line with equation  $2x + 6y = -12$  and passes thru the origin Equation:  $y = 3x$

1) find the slope!

$$6y = -2x - 12$$

$$y = -2/6x - 2$$

$$y = -1/3x - 2$$

$$m = -1/3$$

⊥ means use +3 instead of -

$$1/3$$

$$y = 3x + b$$

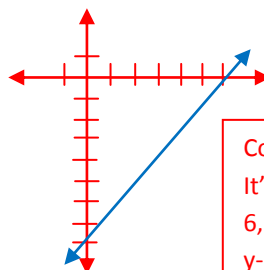
$$0 = 3(0) + b$$

$$0 = 0 + b$$

$$b = 0$$

6) Has x-intercept of 6, and y-intercept of -8 Equation:  $y = \frac{4}{3}x - 8$

Best method on this one: draw it!



Count the slope!  
 It's up 8 and right 6, so  $m = 4/3$ . The y-int. is literally -8!