1.) Solve the equation for y: 3x + 2y = 7.

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

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

2.) Given f(x) = x² (7 - x), find f(5) - f(-1).

$$42$$

$$(5)^2 (7-5)$$
$$(25)(2)$$
$$50$$

$$(-1)^2 (7 - (-1))$$
$$(1)(8)$$
$$8$$

3.) Find the slope from the representations below:

$x_1 \; y_1 \qquad x_2 \; y_2$

(2, 5) and (2, -7)

x	-9	-6	-3	0	3	6	9	12
y	-2	0	2	4	6	8	10	12

+3 +3

+2 +2 +2

$$m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{-7 - 5}{2 - 2} = \frac{-12}{0} \quad \text{undef.}$$

$$m = \frac{2}{3}$$

A ball tossed in the air from ground level is modeled by the function $h(t) = 144t - 16t^2$, where h is the height in feet of the ball in the air and t is the time in seconds.
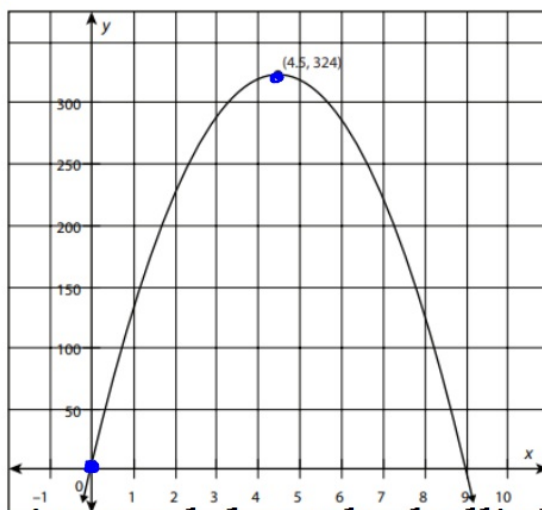
(4.5, 324)

1.) Over what time interval does the ball's height in the air decrease? $4.5 \leq t \leq 9$

2.) Find the average rate of change from the launch to the ball's maximum height. Slope!

$(0,0) \quad (4.5, 324)$

$m = \dfrac{324 - 0}{4.5 - 0} = 72 \text{ ft/sec.}$

GOING BACKWARDS	Sometimes you must complete the ordered pairs using a given slope. **Example:** If the slope of the line passing through the points (-5, 6) and (5, y) is $-\dfrac{4}{5}$, find y.

$\rightarrow$ slope

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

$\overset{x_1 \ y_1}{(-5, 6)} \ \overset{x_2 \ y_2}{(5, y)}$

$$\dfrac{y-6}{5-(-5)} = -\dfrac{4}{5}$$

$$\dfrac{10}{1}\left(\dfrac{y-6}{10}\right) = \left(-\dfrac{4}{5}\right)\dfrac{10}{1}$$

$$y - 6 = -8$$
$$+6 \qquad +6$$
$$y = -2$$

13. (-3, -2) and (x, 6); $m = 2$

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

$$x+3\left(\frac{8}{x+3}\right) = 2(x+3)$$

$$8 = 2x+6$$
$$-6 \qquad -6$$
$$\overline{}$$
$$\frac{2}{2} = \frac{2x}{2}$$

$$x = 1$$

14. (0, -4) and (x, -7); $m = \frac{3}{2}$

$$\frac{-7-(-4)}{x-0} = \frac{3}{2}$$

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

$$\frac{-6}{3} = \frac{3x}{3}$$

$$-2 = x$$

15. (-3, -4) and (-5, y); $m = -\dfrac{9}{2}$

$$\frac{y-(-4)}{-5-(-3)} = -\frac{9}{2}$$

$$\frac{y+4}{-2} = -\frac{9}{2}$$

$$2(y+4) = 18$$

$$2y + 8 = 18$$

$$y = 5$$

16. (x, 2) and (6, 3); $m = -\dfrac{1}{2}$
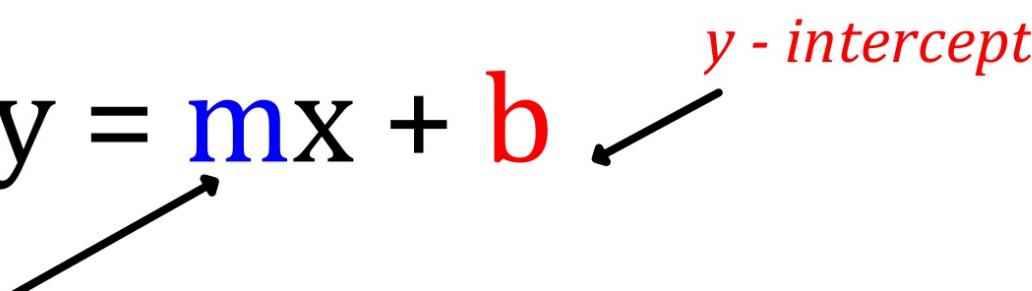
$$\frac{3-2}{6-x} = -\frac{1}{2}$$

$$\frac{1}{6-x} = -\frac{1}{2}$$

$$-1(6-x) = 2$$

$$-6 + x = 2$$

$$x = 8$$

Slope Intercept Form
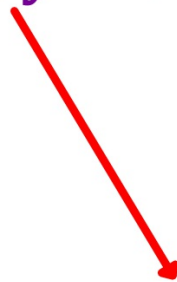
$$y = mx + b$$

y - intercept

slope- always the coefficient paired with the x!

Slope = 2; y-int = -1 $y = 2x - 1$

$-1x = -x$

Standard Form

$$ax + by = c$$

y is still the most important term

Given equations in standard form, you must convert them to slope-intercept form.

Examples:

1. $2x + y = 3$

$$\underline{-2x \quad\quad -2x}$$
$$y = -2x + 3$$
$$m = -2$$
$$b = 3$$

2. $4x + 5y = -30$

$$\underline{-4x \quad\quad\quad -4x}$$
$$\frac{5y}{5} = \frac{-4x}{5} - \frac{30}{5}$$
$$y = \frac{-4}{5}x - 6$$
$$m = \frac{-4}{5}$$
$$b = -6$$

Identify the slope and y-intecept.

3. x − 3y = 12

$$-x \qquad -x$$

$$\frac{-3y}{-3} = \frac{-x}{-3} + \frac{12}{-3}$$

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

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

$$b = -4$$

4. x − y = -8

$$y = x + 8$$

$$m = 1$$

$$b = 8$$

Identify the slope and y-intercept.

5. $4x - y = 0$

$$y = 4x$$
$$m = 4$$
$$b = 0$$

6. $3x - 2y = 14$

$$\frac{-3x \qquad -3x}{-2y = -3x + 14}$$
$$\frac{-2y}{-2} = \frac{-3x}{-2} + \frac{14}{-2}$$
$$y = \frac{3}{2}x - 7$$
$$m = \frac{3}{2}$$
$$b = -7$$

Identify the slope and y-intercept.