# AA – Section 5.3 – Slope-Intercept Form
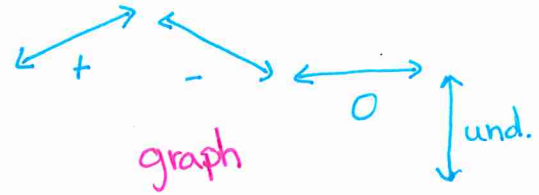
**Review:** Slope

$$m = \frac{rise}{run} \qquad m = \frac{y_2 - y_1}{x_2 - x_1} \quad (x, y_1)(x_2 \, y_2)$$

graph      two points      graph

$+$   $-$   $0$   und.

**Objectives:**
To write linear equations using slope-intercept form;  Graph linear equations in slope-intercept form.

*Essential Understanding:*  You can use the slope and y-intercept of a line to write and graph an equation of the line.

**Vocabulary:**

A *family of functions* is a group of functions with common characteristics.  A *parent function* is the simplest function with these characteristics.  The <u>linear parent function</u> is y = x or f(x) = x.

A <u>linear equation</u> is an equation that models a linear function.

The <u>y-intercept</u> is the y-coordinate of the point where the graph crosses the y-axis.

**KEY CONCEPT:  Slope-Intercept Form of a Linear Equation**

The slope-Intercept Form of a linear equation of a nonvertical line is ___$y = mx + b$___ ;
where *m* is the ___slope___ and *b* is the ___y-intercept___ .

> Slope-Intercept Form:
>
> $$y = mx + b$$
>
> slope      y-intercept

**Examples – Identifying Slope and y-intercept** – What are the slope and y-intercept of the following equations?

1. $y = 2x - 3$

   $m = 2$
   $b = -3$

2. $y = -2x + 1$

   $m = -2$
   $b = 1$

3. $y = \frac{7}{6}x - \frac{3}{4}$

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

4. $y = -\frac{4}{5}x$

   $m = -\frac{4}{5}$   $b = 0$

**Examples – Writing an Equation in Slope-Intercept Form**

$y = mx + b$

5. What is an equation of the line with slope $\frac{3}{2}$ and y-intercept of $-1$ ?    $y = \frac{3}{2}x - 1$

6. What is an equation of the line with slope $-7$ and y-intercept of 6 ?    $y = -7x + 6$

7. What is an equation of the line with slope 0 and y-intercept of 9 ?    $y = 0x + 9$
   $\longrightarrow y = 9$

*You Try:*

**Find the slope and y-intercept of each equation.**

**A.**  $y = -4x + 2$

$m = \underline{-4}$

$b \text{ (y-int)} = \underline{2}$

**B.**  $y = \dfrac{3}{4}x$

$m = \underline{\dfrac{3}{4}}$

$b \text{ (y-int)} = \underline{0}$

**C.**  $y = -x + 1$

$m = \underline{-1}$

$b \text{ (y-int)} = \underline{1}$

**D.**  $y = 6$

$m = \underline{0}$

$b \text{ (y-int)} = \underline{6}$

**E.**  $y = \dfrac{7}{3}x - 6$

$m = \underline{\dfrac{7}{3}}$

$b \text{ (y-int)} = \underline{-6}$

**F.**  $x = -9$

$m = \underline{undefined}$

$b \text{ (y-int)} = \underline{none}$

**Write an Equation in Slope-Intercept Form.**

**G.**  What is an equation of the line with slope $\dfrac{2}{5}$ and y-intercept of $-4$ ?   $\underline{y = \dfrac{2}{5}x - 4}$

**H.**  What is an equation of the line with slope $-2$ and y-intercept of 5 ?   $\underline{y = -2x + 5}$

**I.**  What is an equation of the line with slope 1 and y-intercept of 3 ?   $\underline{y = x + 3}$

**J.**  What is an equation of the line with slope 0 and y-intercept of $-1$ ?   $\underline{y = -1}$

**K.**  What is an equation of the line with slope 10 and y-intercept of 0 ?   $\underline{y = 10x}$

**L.**  What would an equation of the line look like with a slope that is undefined?   $\underline{x = \#}$