x- & y- Intercepts for Linear Equations
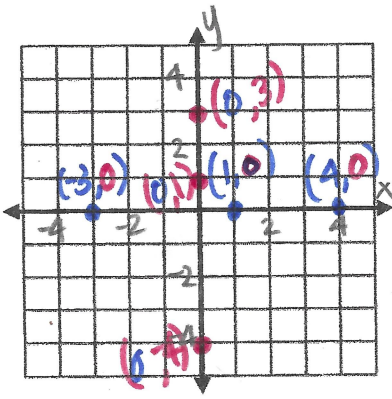
The __x-intercept__ of a line is the point at which the line __touches the x-axis__, where the __y__ value __is ALWAYS equal to zero__. To find the __x intercept__, substitute __y=0__ into the equation and __solve for x__. It is always given in the form, __$(x, 0)$__.

The __y-intercept__ of a line is the point at which the line __touches the y-axis__, where the __x__ value __is ALWAYS equal to zero__. To find the __y intercept__, substitute __x=0__ into the equation and __solve for y__. It is always given in the form, __$(0, y)$__.

Examples:

Determine the intercepts for each equation. Then use the intercepts to graph the line.

1. $2x - 6y = -12$

xint: (y=0) → (-6, 0)

$$2x - 6(0) = -12$$
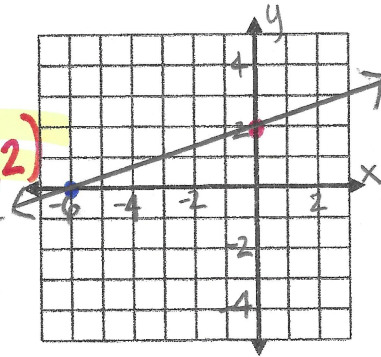$$\frac{2x}{2} = \frac{-12}{2}$$
$$x = -6$$

yint: (x=0) → (0, 2)

$$2(0) - 6y = -12$$
$$\frac{-6y}{-6} = \frac{-12}{-6}$$
$$y = 2$$

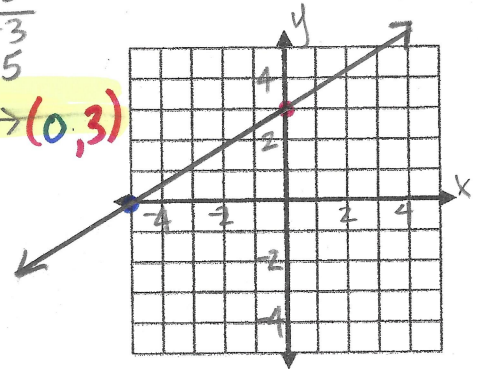2. $5y - 3x = 15$

xint: y=0 → (-5, 0)

$$\frac{-3x}{-3} = \frac{15}{-3}$$
$$x = -5$$

yint: x=0 → (0, 3)

$$\frac{5y}{5} = \frac{15}{5}$$
$$y = 3$$

3. Kaia has $180 to spend on clothes for her upcoming vacation. Her favorite store is having a sale; all tops cost $12 each, and all bottoms cost $18 each. If the given prices include sales tax, how many tops and bottoms can she buy, spending exactly $180? **Write an equation and graph the situation.**

xaxis t = #tops
yaxis b = #bottoms

amount spent on tops = 12t   =180
amount spent on bottoms = 18b

Total Amount spent = amount on tops + amount on bottoms
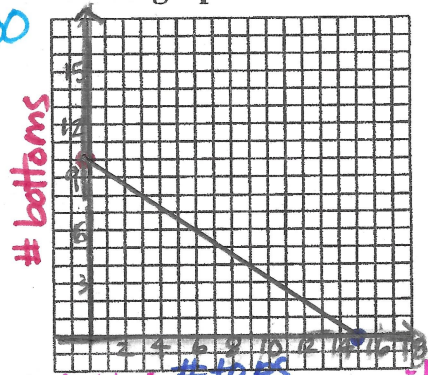
$$180 = 12t + 18b$$

tint: (b=0)   (15, 0)
$$\frac{12t}{12} = \frac{180}{12}$$
$$t = 15$$

bint: (t=0)   (0, 0)
$$\frac{18b}{18} = \frac{180}{18}$$
$$b = 10$$

* since one variable is not necessarily x, INDEPENDANT, the axes could be switched.