

# Graphing By Inspection

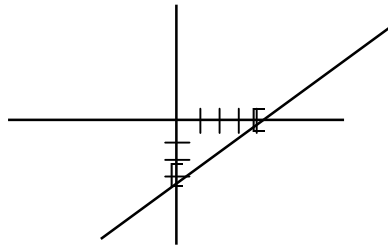
Bill Hanlon

Graphing by inspection takes a lot less time than plotting points. However, if you don't take the time to learn the different terms of a linear equation, you will have no other choice but to solve for  $y$  and plug in  $x$ 's that takes time & space.

Last time we looked at the equation  $3x - 4y = 12$  and found out the graph crosses the  $y$ -axis when  $x = 0$  and crosses  $x$ -axis when  $y=0$ .

Knowing that, 1<sup>st</sup> plugging in  $x = 0$ , we found  $y = -3$ . So we have the ordered pair  $(0, -3)$ , then letting  $y = 0$ , we see that  $x = 4$ . So the  $x$  intercept is at  $(4, 0)$ .

Plotting those 2 points, we have:

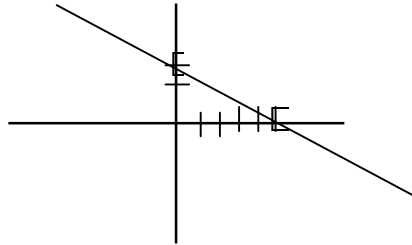


If we connect them we get the line.

Another example:

$$2x + 5y = 10$$

Again, finding the  $x$  and  $y$  intercepts by letting  $x$  and  $y$  be zero. We found the  $x$  intercept is 5, when  $y = 0$ , and the  $y$  intercept is 2 when  $x = 0$ . The ordered pairs are  $(5, 0)$  and  $(0, 2)$ . Plotting & Connecting the points, we have:



The form of the equation  $2x + 5y = 10$  is called the General Form of Equation of a line. It is written  $Ax + By = C$ .

Another form of an equation if a line is called the Slope Intercept and is written  $y = mx + b$ .  $b$  is the intercept and  $m$  is the slope. What that means is if I have the equation:

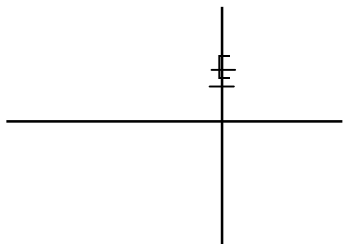
$$y = \frac{3}{5}x + 2$$

Without plugging in  $x$ 's and finding  $y$ 's I can graph this by inspection also.

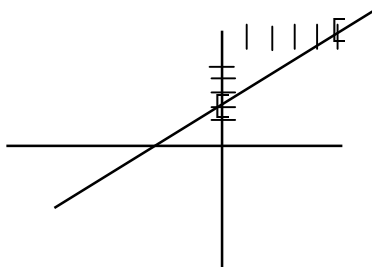
$y = \frac{3}{5}x + 2$  is in the  $y = mx + b$  form.

In our case, the  $y$  intercept is 2.

Graphing, I go up 2 on the y-axis



Now, the slope is  $\frac{3}{5}$ . So from the y intercept (0,2) I go up 3 and over 5 and place a point.



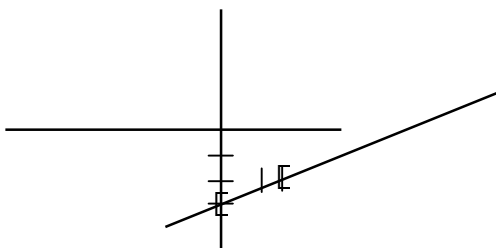
Connect those two points, I have a line.

The question comes down to; would you rather learn a shortcut for graphing or do it the long way?

Let's try one more of each group

Example: Graph  $y = \frac{1}{2}x - 3$

The y intercept is  $-3$ , the slope is  $\frac{1}{2}$  first go to  $(0, -3)$ , then go up 1 and over 2 for the next point.



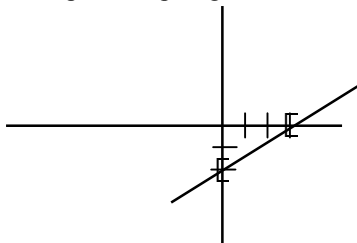
That's the graph.

One more, you say. Graph  $2x - 3y = 6$

Let  $y = 0$ ;  $x = 3$

Let  $x = 0$ ;  $y = -2$

Those are the x and y intercepts. Graphing, we have:



Connect those 2 points and you're done.