

GRAPHING LINES 8.2A

Slope - Intercept Form: All equations of lines in this section are given as functions. Remembering our discussion that $f(x)$ is the same as y , we realize that all these equations are in the form $y = mx + b$.

NOTATION: I have no problem with you substituting y for $f(x)$ if the old notation is easier for you to work with when graphing.

What are m and b ?: This should be merely a review: m is the SLOPE of the line, and b is the y -intercept (since all y -intercepts are found by substituting $x = 0$: The y -intercept is the point where the graph intersects the y -axis and MUST have x -value 0.... notice $f(0) = m(0) + b = b$

GRAPHING, STEP 1, y -intercept: Put the y -intercept on the graph. It is the point $(0, b)$ That is on the y -axis, the vertical one!

GRAPHING, STEP 2, x -intercept: Now find the x -intercept algebraically. What is an x -intercept? This is a point where the Graph intersects the x -axis. Every point on the x -axis has y -value 0, so we can find x -intercepts for ANY GRAPH by setting $y = 0$, the same as $f(x) = 0$, (NOT to be confused with $f(0)$ which was the y -intercept) and solving for x . If you found that your x -intercept was p , then its point is $(p, 0)$.

Plot this point on the x -axis, the Horizontal one! Please do NOT get these two intercepts confused. We will be using them in every graph we do this semester!

GRAPHING, STEP 3, Slope to get a 3rd Point as a Check: For the purposes of the GRAPH, think of your slope as $\frac{Rise}{Run}$ and use this to start from the y -intercept and go up and over or down and over the needed amount to locate another point of the line.

GRAPHING, STEP 4, Does it LINE UP?: If the 3 points you have plotted are in a straight line as they should be, then put down your straight edge and

CONNECT THE DOTS!.....

If your points do NOT line up, then you have made an error, and you will have to backtrack to find it, or start over and try again.

GRAPHING, Final Check: If the slope is positive, your line should *go up* left to right; but if the slope is negative, the line should *go down* left to right. This Final Check could have caught a lot of errors that I have seen on tests!

Do it My Way or Else?: NO, but I do require that you identify and plot both the x - and y -intercepts and find the slope. You must plot a third point, but you can do it another way if you like. This is just the most efficient method that I have found. Having a firm knowledge of x - and y -intercepts is an essential skill for good graphing, thus I require it.