day60 Scratch – grapher
Due Tuesday 6th period, Wednesday 7th period

Your task today is to make a program that graphs equations. You should choose a type of equation and/or program that fits your skill level, both in math class, and here in Computer Programming. (In other words, if you're in Math 1 consider graphing a linear equation in the form $y = mx + b$, but if you're in Math 2 or higher, consider graphing a quadratic, cubic, trig, radical or logarithm and perhaps adding choices to graph different types of equations.)

Scratch comes with an x-y coordinate plane graphing background. Feel free to use that if you want (see image to the right).
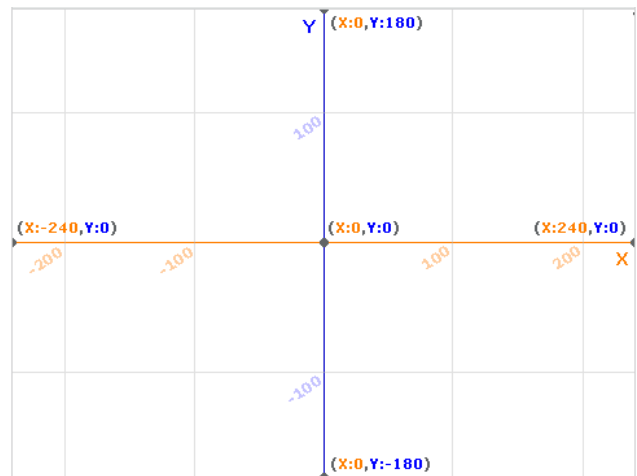
As a refresher, the coordinate plane is made up of two axes (lines), the x-axis that runs horizontally and the y-axis that runs vertically. The point ( 0, 0 ) is the very center (see if you can find that point in the image here above right.) The viewable space of a Scratch project goes from -240 to 240 x and -180 to 180 y.

If you are doing a linear equation you'd need to ask the user for the slope and then the y intercept, then use the formula $y = mx + b$ where m is the slope and b is the y intercept.

If you are doing a quadratic equation the formula is $y = ax^2 + bx + c$ so you'd be asking the user for an a, b, and c. If you graph a more complex equation, you'll need to figure out what you need to ask the user for.

Since the x-axis (left/right direction) goes from x = -240 to x = 240 anything you graph should attempt to run across the whole distance. One way to do this is to use a repeat 480 times loop with a change x by 1 block in it, then to set the y value to your equation. I actually ended up using change x by 5 for two of my modes as it took too long to graph otherwise. Another way is to create an x variable and a y variable and then use a go to x/y block after running your calculations. You should do a pen up before you move and then a pen down after you go to the location you are trying to go to so that you aren't scribbling pen marks all over the screen.
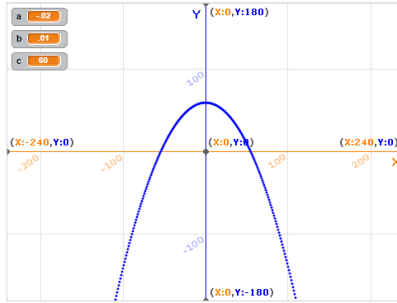
Here are some specifics:
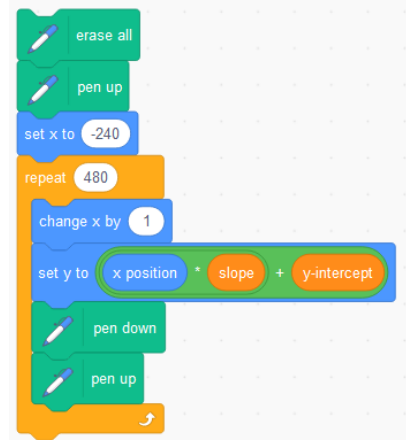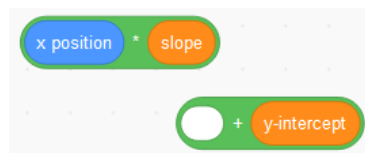
As shown above you can get the green blocks out of Operators, x position is near the bottom of the Motion block group, slope and y-intercept are variables I created. I put them together into a repeat loop to draw my line using the code to the right.

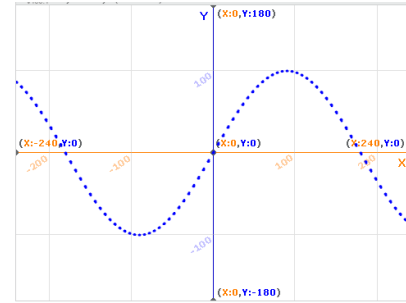Call me over to see your project before you turn it in. Thanks.

See sample outputs from my program that graphs lines, parabolas, and the sin function (trigonometry) on the next page.
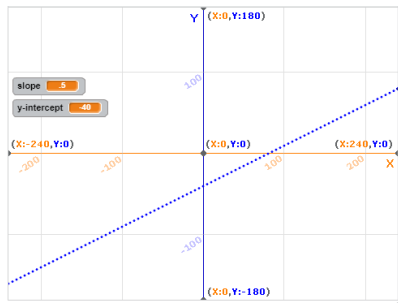
**A line**

**A parabola**

**The sin function**