

Extra Reading2: Plotting Graphs

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This note is aimed at explaining how to plot graphs. You might find this too simple (or not). We will look at examples with and without numbers.

Consider the following equation: $M = p \cdot X + q \cdot Y$. M , p , q are constants (or parameters, if you want to use a different name). X and Y are variables. Variables are items which represent something; and variables are allowed to change, pretty much by themselves. If a parameter changes, then it is “we” who makes that change. You will see shortly what I mean.

Examples of variables could be the number of eggs you had for breakfast or the pairs of shoes you own.

What we want to do is plot this equation on something called an (X,Y) plane. That is just a fancy name for a something which measures the X and Y variable. To make things easier, let’s assume that all parameters and variables are never negative in value.

Before you start to plot this, take a look at your typical (X,Y) plane:

This is where we plot our graph.

Now, we will need two end points to draw a graph. How to do that? Simple. Look, when you draw this line, since X and Y are both positive, they won’t go beyond the horizontal and vertical lines. These lines are called axes. So horizontal(X axis) and vertical(Y axis) will contain the endpoints of our graph.

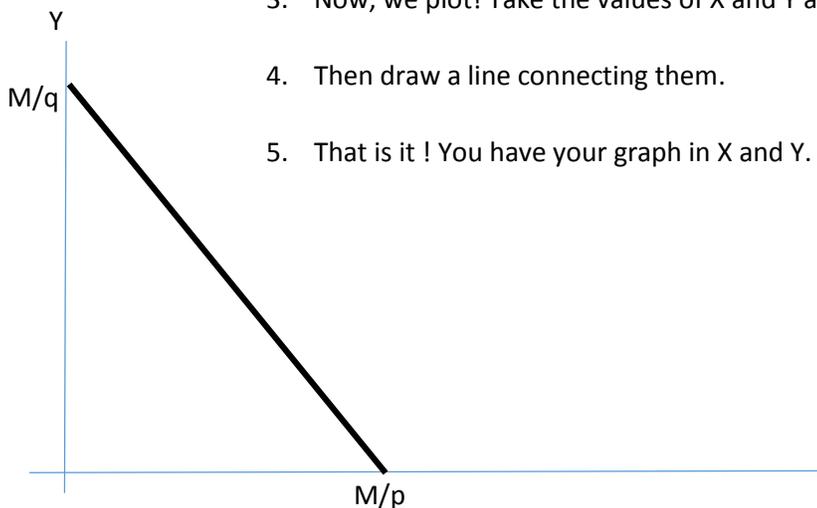
1. On the horizontal axis, the variable Y is zero. So, to get the intercept(the point where the graph meets the axis) on X axis, we set $Y=0$ in the equation and thus get:
$$M = p \cdot X + q \cdot 0 = p \cdot X \Rightarrow M = p \cdot X \Rightarrow M/p = X.$$

2. In the same way, find the Y intercept. Set X equal to zero. And you have $M/q = Y$

3. Now, we plot! Take the values of X and Y and put them on the graph.

4. Then draw a line connecting them.

5. That is it ! You have your graph in X and Y .



Let us try the same thing again, but now with numbers.

Consider the equation: $Y = 100 - 5 \cdot X$. Don't be alarmed. I am still writing the equation of a straight line. And the technique will still be the same as before.

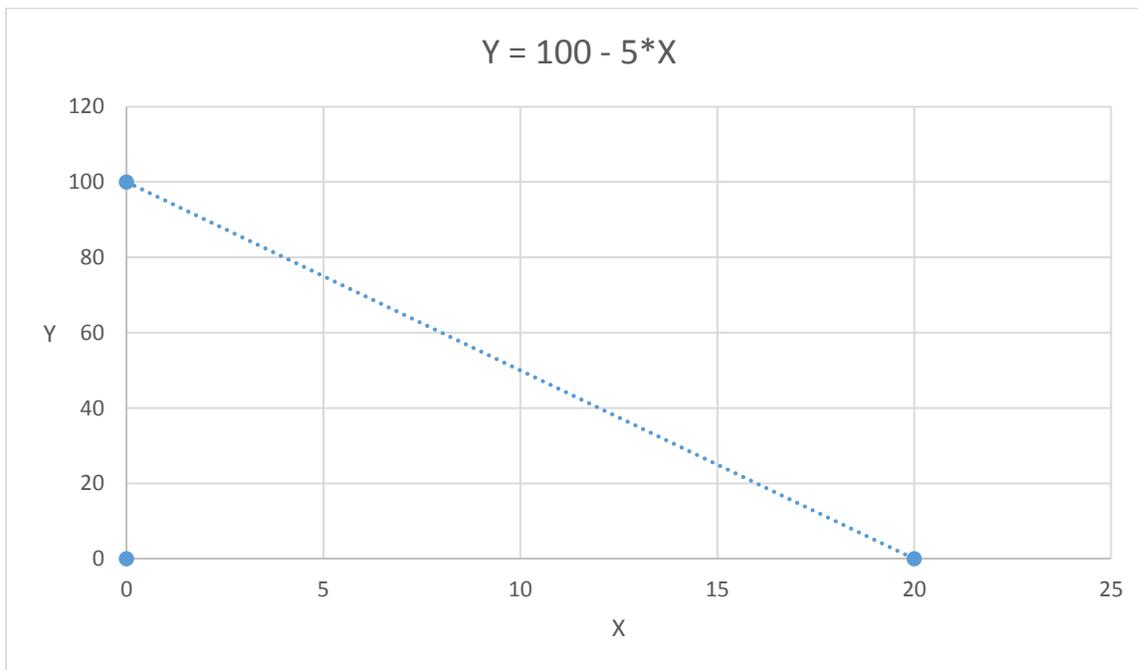
So we need to find the two intercepts.

1. Setting $X = 0$, we get $Y = 100 - 5 \cdot 0 = 100$
2. Setting $Y = 0$, we get $0 = 100 - 5 \cdot X \Rightarrow 5 \cdot X = 100 \Rightarrow X = 100/5 = 20$

Quick Note: When I am referring to a point (a,b) I mean X takes value a and Y takes value b . So the point $(0,100)$ would actually be the Y intercept. Where $X = 0$ and $Y = 100$.

Okay, so we have the two intercepts. Now we plot, just like before.

3. Locate the points on the graph and draw a line connecting them.



That is it. Now what we do next is use this technique to understand some concepts in Economics.