

Econ 102 Discussion - Week 1

January 24-25, 2014

Finding an intercept

In order to find the intercept of a variable in an equation, all you have to do is set the *other* variable equal to 0. Then, solve for the original variable and you have your intercept.

If your equation is $y = 2x + 3$, setting $x = 0$ gives you the y intercept of 3 and setting $y = 0$ gives you the x intercept of $-\frac{3}{2}$.

Exercise 1. Suppose price P is given as a function of quantity demanded X by

$$P = 500 - 2X$$

What is the value of X that make P zero? Value of P that makes X zero?

Graphing a line

If you have two points on a line, (x_1, y_1) and (x_2, y_2) , you can find the equation of the line by first calculating the slope:

$$\text{slope} = \frac{y_1 - y_2}{x_1 - x_2}$$

Then, plug in the slope and one of the points into the general equation of a line to solve for the intercept:

$$\text{intercept} = y_1 - \text{slope} \cdot x_1$$

Finally, plug your slope and intercept back in the equation:

$$y = \text{slope} \cdot x + \text{intercept}$$

Exercise 2. The price is 4 when the quantity demand is 400. The price is 3 when the quantity demanded is 300. Find the equation of the demand function.

Finding an intersection

To find the intersection of two lines (useful for equilibria) you need to solve for each of the two variables using any method (substitution method, elimination method, graphing method) you feel comfortable with.

Exercise 3. Demand is given by

$$P = 10 - 2X$$

and supply is given by

$$P = 8X$$

Find the equilibrium by solving for the variables.

Percentage changes/growth rates

If you have a variable X that has a new value in each year t , you can calculate the percentage change g with the formula

$$g_t = \frac{X_{t+1} - X_t}{X_t}$$

Exercise 4. Income per person in Loompaland was \$200 in 2005. In 2010, the income per person was \$240. Calculate the percentage change in income per person between 2005 and 2010.

Calculating averages

The average of any variable is the total sum of all the observations of that variable divided by the number of observations available. The equation is:

$$\text{Average}(X) = \frac{X_1 + \dots + X_N}{N}$$

Exercise 5. China grew at a rate of 7.7% in 2012 and at a rate of 9.3% in 2011. At what rate would China need to have grown in 2013 to have a three-year average of 8%?