Lab 1 Questions for ECON 2101-001 (Intermediate Microeconomics)

Week of May 3, 2017

1. Graph the following curves with y on the vertical axis and x on the horizontal axis:
    a) $y=ax+b$, where $a<0$ and $b>0$.
    b) $y=ax+b$, where $a>0$ and $b<0$
    c) $y=2x+10$ and $y= -2x-10$
    d) $x=10-(1/2)y$
    e) $x=10$
    f) $y= 5$
    g) $y=x^2+5$
    h) $y=x^{1/2}$
    i) $y=x$ if $0\leq x<20$, $y=20$ if $x\geq 20$
    j) $y=120/x$ and $y=240/x$, $x>0$
    k) $y=\min\{x, 16\}$, $x>0$
    l) $y= \min\{x, 16\}+x$, $x>0$
    m) $y=x+120/x$, $x>0$

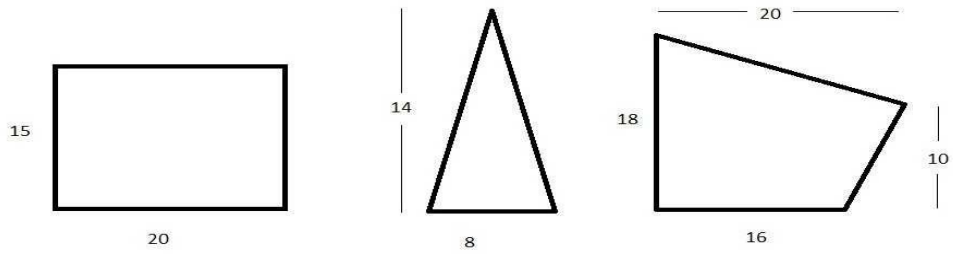
2. Graph the following curves with x_2 on the vertical axis and x_1 on the horizontal axis(x_1, $x_2>0$)
    a) $120=2x_1+4x_2$
    b) $y= 2x_1+4x_2$
    c) $120= \min\{2x_1,4x_2\}$
    d) $y=\min\{2x_1,4x_2\}$
    e) $120= x_1 x_2$
    f) $y= x_1 x_2$

3. Suppose you are told that $y=20-2x+w$, where x and w are independent variables and y is the dependent variable. (This means $y=f(x,w)$, or "y is a function of x and w").
    a. Evaluate f(0,0), f(5,10) and f(10,20).
    b. Fix w=10, but allow x to vary. Draw the line in (x,y) "space." Repeat this exercise for w=20 on the same graph.
    c. Now fix x=10, but allow w to vary. Draw the line in (w,y) "space." Repeat this exercise for x=20 on the same graph.

4. Take two functions: y=36-3x and y=3x. Find the x and y values that solve both equations and show on a graph. Repeat this process for y=45-3x and y=3x. Draw the new solution on the same diagram.

5. What is the x-intercept of the curve $y=4x^2-b$, where $b>0$?

6. Find the areas of the shapes below:



7. (Time Permitting) A statistician estimates the demand for pizzas (x_1) to be given by:

$$x_1 = 20 + 0.1m - 2p_1 + 0.5p_2$$

Where m is income, p_1 is the price of pizzas and p_2 is the price of a bucket of fried chicken.

a) Suppose m = 200 and p2 = 10. Find the price elasticity of demand when $p_1 = 10$ and explain this in words. At this price, is the demand for pizza elastic or inelastic?

b) Suppose m = 200 and $p_1 = 10$. Find the cross-price elasticity of demand when $p_2 = 10$, and explain this in words. Is fried-chicken a substitute for pizza?

c) Suppose $p_1 = 10$ and $p_2 = 10$. Find the income elasticity of demand when m = 200, and explain this in words. At this income, is pizza a necessity or a luxury good?