MATH 1090-8: QUIZ 3 SOLUTIONS
no calculators allowed!
September 13, 2007

1. Suppose a certain outlet chain selling appliances has found that for one brand of stereo system the monthly demand is 200 units when the price is $800. However, when the price is $750, the monthly demand is 225 units. Assuming the demand function for this item is linear, write the equation for the demand. Use p for price and q for quantity.

Solutions. We are to find the line throught the that passes through the following two quantity-price points: $(200, 800)$ and $(225, 750)$. We first compute the slope as

$$\frac{800 - 750}{200 - 225} = -2.$$

Note the slope is negative, as it should be for a demand function. Now we use the point-slope form using, say, the point $(200, 800)$ to get

$$(p - 800) = -2(q - 200)$$

which simplifies to

$$p = -2q + 1200.$$

2. Find the market equilibrium point for the following supply and demand functions:

$$\text{(D)} \qquad p = -5q + 430$$
$$\text{(S)} \qquad p = 15q + 30.$$

Solutions. We equate supply and demand to get

$$-5 + 430 = 15q + 30$$

which we can solve easily to find the equilibrium quantity

$$q_{\text{eq}} = 20.$$

Plugging back into, say, the supply curve we find an equilibrium price

$$p_{\text{eq}} = -5 \cdot 20 + 430 = 330.$$

3. True or False: If a tax is levied on the supplier in Problem 2, the result is that the market equilibrium quantity will increase. Clearly circle one (and only one) of the following:

$\boxed{\text{FALSE}}$ (The equilibrium quantity will decrease.)