ECO 610
Fall 2016
Problem Set #2 KEY

[10 points total]

1. Your cousin, who works for the Kentucky DMV, asks you for advice about how to price personalized (vanity) license plates. After doing some research, you find that the number of vanity plates sold annually in Kentucky dropped from 95,000 to 45,000 when the price was increased from $25 to $40.
   a. Calculate the elasticity of demand for personalized license plates in Kentucky. Show your work.

[2 points]

$E_{X, Px}$ = - % change in quantity demanded / % change in price

$E_{X, Px}$ = - [(95000 – 45000)/(95000 + 45000)] / [(25 – 40)/(25 + 40)]

$E_{X, Px}$ = (5/14) / (15/65) = 65/42 = 1.55

   b. The state prison system has estimated that personalizing a license plate adds an extra $7 to the cost of stamping out a license plate by inmates in Kentucky prisons [https://www.youtube.com/watch?v=oklKAMEOT7I]. Based on that information, do you think that increasing price was a good idea if the legislature wants to maximize net revenue (profit) from this program.

[2 points]

Think of making this change in reverse. Lower price from $40 to $25. Quantity sold increases from 45,000 to 95,000. Total revenue increases by $575, 000, or from $1.8m to $2.375m. When you increase the production of license plates by 50,000, you increase your costs by $7 per plate times 50,000. Total costs increase by $350,000 while total revenues increase by $575,000. Profits go up by the difference in the two, or by$275,000.
Now reason in reverse. If you do the opposite and raise price and reduce output, profits will fall by $275,000. Bad move.

2. As manager of a local convenience store, you decide to try a marketing experiment. You raise the price of Pepsi from $4.99 per twelve-pack to $5.49 per twelve-pack, while holding the price of Coke constant. You find that Coke sales increase by about 50 percent. Calculate the cross-price elasticity of demand between Pepsi and Coke. Show your work.

[3 points]

E_{X, P_Y} = % change in quantity demanded of good X / % change in price of good Y

E_{X, P_Y} = 50% / [(4.99 – 5.49)/½(4.99 + 5.49)] = 50% / 9.54% = 5.24

3. Recently the state of New Mexico raised the tax on beer, leading to a ten-percent increase in the price of beer. Beer sales fell by around five percent statewide. In the adjoining state of Texas, the managers of Lone Star Brewing Company observed the experience of the state of New Mexico and decided to raise the price of their premium Pearl beer by five percent. They experienced a ten percent drop in quantity sold. Perplexed, they turn to you for an explanation for this seeming anomaly.

[3 points]

The tax increase in New Mexico raised the price of all beer sold in the state. Consumers put off by the price increase could turn to other alcoholic beverages like wine or liquor, or to non-alcoholic beverages like soft drinks, fruit juices, or milk. The pricing experiment conducted by Lone Star Brewing Co. raised the price of one particular brand of beer, while the prices of other brands stayed the same. Substitutes for Lone Star's Pearl brand include dozens and dozens of other brands of beer, which many consumers obviously considered a reasonable substitute for Pearl beer. The narrower the definition of the product, the more close substitutes there will be, and the more elastic demand will tend to be.