

Answer key to homework #4

Chapter 4

Problems:

3. a. This is a straight line demand curve since for every \$0.50 increase in price, the quantity of bottles demanded falls by a fixed amount (100). (1 point)

- b. Demand is *inelastic* for this price change. (1 point)

$$\begin{aligned} E &= \frac{500 - 400}{\left(\frac{500 + 400}{2}\right)} \div \frac{1 - 1.50}{\left(\frac{1 + 1.50}{2}\right)} \\ &= \frac{100}{450} \div \frac{-0.50}{1.25} \\ &= -0.55 \end{aligned}$$

- c. Demand is *elastic* for this price change. (1 point)

$$\begin{aligned} E &= \frac{200 - 100}{\left(\frac{200 + 100}{2}\right)} \div \frac{2.50 - 3}{\left(\frac{2.50 + 3}{2}\right)} \\ &= \frac{100}{150} \div \frac{-0.50}{2.75} \\ &= -3.66 \end{aligned}$$

- d. As we slide down the demand curve, the price elasticity of demand changes from -0.366 to -0.55, that is, it becomes *less* elastic. (1 point)

- e. (2 points)

P	Q_d	Total Expenditure
1	500	500
1.50	400	600
2.00	300	600
2.50	200	500
3.00	100	300

- f. From the table in part e, we can confirm that an increase in price in the inelastic range (from \$1 to \$1.50) led to an increase in total expenditure, while an increase in price in the elastic range (from \$2.50 to \$3.00) led to a decrease in total expenditure. (1 point)

5. a. More elastic.(0.5 point)

- b. Quantity demanded will fall by 2,311 bottles. Find this answer by substituting what is known into the equation for price elasticity of demand and solving for x and then multiplying the initial number of bottles of Pepsi demanded by the result:

$$-2.08 = x \div 0.1111$$

$$x = -0.2311$$

$$\text{Change in quantity demanded} = -0.2311 \times 10,000 = -2,311 \quad (1 \text{ point})$$

- c. The price of ground beef will have to increase by 4.9%. Find this by substituting what is known into the equation for price elasticity of demand and solving for x:

$$-1.02 = -5 \div x$$

$$x = 4.9\%$$

(1 point)

6. From \$10,000 to \$20,000, $E_I = 0.27$; from \$40,000 to \$50,000, $E_I = 0.53$.

(2 points)

- a. *Normal* (at least for the income levels listed), since $E_I > 0$.(0.5 point)
- b. As income rises, the proportion of household income spent on this good decreases.(0.5 point)
- c. The good would be considered an economic necessity since $0 < E_I < 1$, i.e., income elasticity of demand is between zero and 1.(0.5 point)

8. a. Cannot tell from the information given.(1 point)

b. Cannot tell from the information given.(1 point)

c. The quantity of ground beef demanded will increase by 1.2%.(1 point)

9. a. They should *increase their price to \$30/hr*. Since the price elasticity of demand for their service is -0.5 , the 50% increase in their price will result

in only a 25% decline in demand—hence “Three Guys” revenues will increase. (Also note: They will be doing less moving at a higher price, so their other costs will go down as well, and they will enjoy more leisure.) (2 points)

b. *Demand is likely to become more elastic.* The availability of substitutes is one of the primary determinants of price elasticity of demand. Increased competition from companies providing essentially the same service will make demand for “Three Guys” services more sensitive to changes in price, hence, more elastic.(2 points)