**Chapter Three**

**Quantitative Demand Analysis**

**CONCEPTUAL AND COMPUTATIONAL QUESTIONS**

1. Answer the following questions based on the accompanying diagram.
2. How much would the firm’s revenue change if it lowered price from $12 to $10? Is demand elastic or inelastic in this range?
3. How much would the firm’s revenue change if it lowered price from $4 to $2? Is demand elastic or inelastic in this range?
4. What price maximizes the firm’s total revenues? What is the elasticity of demand at this point on the demand curve?



1. The demand curve for a product is given by $Q\_{x}^{d}=1,000-2P\_{x}+ .02P\_{z }$where $P\_{z}=\$400.$
2. What is the own price elasticity of demand when $P\_{x}=\$154? $Is demand elastic or inelastic at this price? What would happen to the firm’s revenue if it decided to charge a price below $154?
3. What is the own price elasticity of demand when $P\_{x}=\$354?$ Is demand elastic or inelastic at this price? What would happen to the firm’s revenue if it decided to charge a price above $354?
4. What is the cross-price elasticity of demand between good *X* and good *Z* when $P\_{x}=\$154? $Are goods *X* and *Z* substitutes or complements?
5. Suppose the demand function for a firm’s product is given by

In $Q\_{x}^{d}=3-0.5 In P\_{x}- 2.5 In P\_{y}+$ In *M* + 2 In *A*

Where

$$P\_{x}=\$10$$

$$P\_{y}=\$4,$$

$$M=\$20,000, and$$

*A = $250*

1. Determine the own price elasticity of demand, and, and state whether demand is elastic, inelastic or unitary elastic.
2. Determine the cross-price elasticity of demand between good X and good Y, and state whether these two goods are substitutes or complements.
3. Determine in income elasticity of demand, and state whether good X is a normal or inferior good.
4. Determine the own advertising elasticity of demand.
5. Suppose the own price elasticity of demand for good *X* is – 2, its income elasticity is 3, its advertising elasticity is 4, and the cross-price elasticity of demand between it and good *Y* is – 6. Determine how much the consumption of this good will change if:
6. The price of good *X* increases by 5 percent.
7. The price of good *Y* increases by 10 percent.
8. Advertising decreases by 2 percent.
9. Income falls by 3 percent.
10. Suppose the cross-price elasticity of demand between goods *X* and *Y* is – 5. How much would the price of good *Y* have to change in order to increase the consumption of good *X* by 50 percent?
11. You are the manager of a firm that receives revenues of $30,000 per year from product *X* and $70,000 per year from product *Y*. The own price elasticity of demand for product *Y* and *X* is – 2.5, and the cross-price elasticity of demand between product *Y* and *X* is 1.1. How much will your firm’s total revenues (revenues from both products) change if you increase the price of good *X* by 1 percent?
12. A quant jock from your firm used a linear demand specification to estimate the demand for its product and sent you a hard copy of the results. Unfortunately, some entries are missing because the toner was low in her printer. Use the information presented at the top of the next page (page 112) to find the missing values labeled ‘1’ – ‘7’ (round your answer to nearest hundredth). Then, answer the accompanying question.
13. Based on these estimates, write an on question that summarizes the demand for the firm’s product.
14. Which regression coefficients are statistically significant at the 5 percent level?
15. Comment on how well the regression line fits the data.
16. Suppose the true inverse demand relation for good *X* is *P* = a + b*Q* + e, and you estimated the parameters to be $\hat{a}=$10, $\hat{b}= -2.5, σ\_{â}=1, and σ\_{b}= $0.5. Find the approximate 95 percent confidence interval for the true values of *a* and *b*.