1. The demand curve for a product is given by

\[ Q_X^d = 1000 - 2P_X + 0.2P_Z \] where \( P_Z = $400 \)

a. What is the price elasticity of demand for \( Q^d \) when \( P_X = $354 \)? Is the demand elastic or inelastic at this price? What would happen to the firm’s revenue if it decided to charge a price above $354?

b. 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?

2. 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:

a. the price of good Y increases 10 percent.

b. advertising falls by 2 percent.

c. income falls by 3 percent.

3. Revenue at a major cellular telephone manufacturer was $1.4 billion for the nine months ending March 2, up 97 percent over revenues for the same period last year. Management attributes the increase in revenues to a 137 percent increase in shipments, despite a 17 percent drop in the average blended selling price of its line of phones. Given this information, is it surprising that the company’s revenue increased when it decreased the average selling price of its phones? Explain.

4. Recently, Pacific Cellular ran a pricing trial in order to estimate the elasticity of demand for its services. The manager selected three states that were representative of its entire service area and increased prices by 5 percent to customers in those areas. One week later, the number of customers enrolled in Pacific’s cellular plans declined 4 percent in those states, while enrollments in states where prices did not change remained flat. The manager used this information to estimate the price elasticity of demand for their product and, based on her findings, immediately increased prices in all market areas by 5 percent in an attempt to boost the company’s 2007 annual revenues. One year later, the manager was perplexed because Pacific Cellular’s 2007 annual revenues were 10 percent lower than those in 2006 – the price increase apparently led to a reduction in the company’s revenues. Did the manager make an error? Explain.

5. The owner of a small chain of gasoline stations in a large Metropolitan town read an article in a trade publication stating that the own-price elasticity of demand for gasoline in the United States is -0.2. Because of this highly inelastic demand in the United States, he is thinking about raising his prices to increase revenues and profits. Do you recommend this strategy based on the information he has obtained? Explain.