Chapter 5 Exercises

Self-Check Questions

1. From the data shown in the following table about demand for smart phones, calculate the price elasticity of demand from: Point *B* to Point *C*, Point *D* to Point *E*, and Point *G* to Point *H*. Classify the elasticity at each point as elastic, inelastic, or unit elastic.

Point	Price	Quantity Demanded
A	$60	3,000
B	$70	2,800
C	$80	2,600
D	$90	2,400
E	$100	2,200
F	$110	2,000
G	$120	1,800
H	$130	1,600

2. From the data shown in the following table about supply of alarm clocks, calculate the price elasticity of supply from: Point *J* to Point *K*, Point *L* to Point *M*, and Point *N* to Point *P*. Classify the elasticity at each point as elastic, inelastic, or unit elastic.

Point	Price	Quantity Supplied
J	$8	50
K	$9	70
L	$10	80
M	$11	88
N	$12	95
P	$13	100

3. Why is the demand curve with constant unit elasticity concave?

4. Why is the supply curve with constant unit elasticity a straight line?

5. The federal government decides to require that automobile manufacturers install new anti-pollution equipment that costs $2,000 per car. Under what conditions can carmakers pass almost all of this cost along to car buyers? Under what conditions can carmakers pass very little of this cost along to car buyers?

6. Suppose you are in charge of sales at a pharmaceutical company, and your firm has a new drug that causes bald men to grow hair. Assume that the company wants to earn as much revenue as possible from this drug. If the elasticity of demand for your company's product at the current price is 1.4, would you advise the company to raise the price, lower the price, or to keep the price the same? What if the elasticity were 0.6? What if it were 1? Explain your answer.

7. What would the gasoline price elasticity of supply mean to UPS or FedEx?

8. The average annual income rises from $25,000 to $38,000, and the quantity of bread consumed in a year by the average person falls from 30 loaves to 22 loaves. What is the income elasticity of bread consumption? Is bread a normal or an inferior good?

9. Suppose the cross-price elasticity of apples with respect to the price of oranges is 0.4, and the price of oranges falls by 3%. What will happen to the demand for apples?

Review Questions

10. What is the formula for calculating elasticity?

11. What is the price elasticity of demand? Can you explain it in your own words?

12. What is the price elasticity of supply? Can you explain it in your own words?

13. Describe the general appearance of a demand or a supply curve with zero elasticity.

14. Describe the general appearance of a demand or a supply curve with infinite elasticity.

15. If demand is elastic, will shifts in supply have a larger effect on equilibrium quantity or on price?

16. If demand is inelastic, will shifts in supply have a larger effect on equilibrium price or on quantity?

17. If supply is elastic, will shifts in demand have a larger effect on equilibrium quantity or on price?

18. If supply is inelastic, will shifts in demand have a larger effect on equilibrium price or on quantity?

19. Would you usually expect elasticity of demand or supply to be higher in the short run or in the long run? Why?

20. Under which circumstances does the tax burden fall entirely on consumers?

21. What is the formula for the income elasticity of demand?

22. What is the formula for the cross-price elasticity of demand?

23. What is the formula for the wage elasticity of labor supply?

24. What is the formula for elasticity of savings with respect to interest rates?

Critical Thinking Questions

25. Transatlantic air travel in first class has an estimated elasticity of demand of 0.40 less than transatlantic air travel in economy class, with an estimated price elasticity of 0.62. Why do you think this is the case?

26. What is the relationship between price elasticity and position on the demand curve? For example, as you move up the demand curve to higher prices and lower quantities, what happens to the measured elasticity? How would you explain that?

27. Can you think of an industry (or product) with near infinite elasticity of supply in the short term? That is, what is an industry that could increase Q_s almost without limit in response to an increase in the price?

28. Would you expect supply to play a more significant role in determining the price of a basic necessity like food or a luxury like perfume? Explain. (*Hint*: think about how the price elasticity of demand will differ between necessities and luxuries.)

29. A city has built a bridge over a river and it decides to charge a toll to everyone who crosses. For one year, the city charges a variety of different tolls and records information on how many drivers cross the bridge. The city thus gathers information about elasticity of demand. If the city wishes to raise as much revenue as possible from the tolls, where will the city decide to charge a toll: in the inelastic portion of the demand curve, the elastic portion of the demand curve, or the unit elastic portion? Explain.

30. In a market where the supply curve is perfectly inelastic, how does an excise tax affect the price paid by consumers and the quantity bought and sold?

31. Economists define normal goods as having a positive income elasticity. We can divide normal goods into two types: Those whose income elasticity is less than one and those whose income elasticity is greater than one. Think about products that would fall into each category. Can you come up with a name for each category?

32. Suppose you could buy shoes one at a time, rather than in pairs. What do you predict the cross-price elasticity for left shoes and right shoes would be?

Problems

33. The equation for a demand curve is $P = 48 - 3Q$. What is the elasticity in moving from a quantity of 5 to a quantity of 6?

34. The equation for a demand curve is $P = \frac{2}{Q}$. What is the elasticity of demand as price falls from \$5 to \$4? What is the elasticity of demand as the price falls from \$9 to \$8? Would you expect these answers to be the same? First solve for Q at both prices:

35. The equation for a supply curve is $4P = Q$. What is the elasticity of supply as price rises from \$3 to \$4? What is the elasticity of supply as the price rises from \$7 to \$3? Would you expect these answers to be the same?

36. The equation for a supply curve is $P = 3Q - 8$. What is the elasticity in moving from a pr ice of \$4 to a price of \$7?

37. The supply of paintings by Leonardo da Vinci, who painted the *Mona Lisa* and *The Last Supper* and died in 1519, is highly inelastic. Sketch a supply and demand diagram, paying attention to the appropriate elasticities, to illustrate that demand for these paintings will determine the price.

38. Say that a certain stadium for professional football has seventy thousand seats. What is the shape of the supply curve for tickets to football games at that stadium? Explain.

39. When someone's kidneys fail, the person needs to have medical treatment with a dialysis machine (unless or until they receive a kidney transplant) or they will die. Sketch a supply and demand diagram, paying attention to the appropriate elasticities, to illustrate that the supply of such dialysis machines will primarily determine the price.

40. Assume that the supply of low-skilled workers is fairly elastic, but the employers' demand for such workers is fairly inelastic. If the policy goal is to expand employment for low-skilled workers, is it better to focus on policy tools to shift the supply of unskilled labor or on tools to shift the demand for unskilled labor? What if the policy goal is to raise wages for this group? Explain your answers with supply and demand diagrams.