

Elasticity Practice

Here you will find a few exercises to test your understanding of the concept of price elasticity. All that you really need to know is the definitions of price elasticity and of revenue. The rest you can handle by just using your head and performing simple calculations. In words, we can state the definition of elasticity of demand as "percent change in *quantity* divided by percent change in *price* as one moves along the demand curve." More specifically, suppose that the demand curve is given by an equation $p = P_d(q)$. Suppose that we are given two points on a demand curve. One point is a quantity q and a price $p = P_d(q)$ on this demand curve. The other point is a different quantity q' and price p' on the demand curve. Let E_d be the elasticity of demand for the movement between these two points.

$$E_d = \left(\frac{q' - q}{q} \right) \div \left(\frac{p' - p}{p} \right). \quad (1)$$

We can use this definition to solve Problem 1. From equation 1, we see that if we know any two of the numbers E_d , $\left(\frac{q' - q}{q} \right)$ and $\left(\frac{p' - p}{p} \right)$, we can calculate the third. This fact is sufficient to allow you to figure out the answers to problems 1-3. To answer problem 4, you need also to use the fact that revenue is equal to price times quantity. To answer problem 5, it is useful to notice that Equation (1) can be rearranged to read

$$E_d = \left(\frac{q' - q}{p' - p} \right) \times \left(\frac{p}{q} \right). \quad (2)$$

Along a straight line, the ratio

$$\frac{q' - q}{p' - p}$$

is constant. You should be able to figure out what this constant is for the demand curve in Problem 5. Then you should be able to write an equation that you can solve to determine where on this line the elasticity of demand is -1.

Typos in introduction fixed (4/25, 4:30 pm, 4/26, 9 pm)

1. An improvement in the weather led to an increase of 60% in the size of the corn crop. The demand curve for corn did not change. The price of corn fell by 20%. From this we can conclude that:
 - (a) The elasticity of demand for corn is -3 .
 - (b) The elasticity of demand for corn is $-1/3$.
 - (c) The elasticity of supply for corn is -3 .
 - (d) The elasticity of supply for corn is $1/3$.
 - (e) The elasticity of supply for corn is $-1/3$.
2. Suppose that the oil cartel succeeded in reducing the supply of crude oil by 5% and suppose that the price elasticity of demand for crude oil is -0.10 . What will happen to the equilibrium price of crude oil?
 - (a) It will fall by 5%.
 - (b) It will rise by 5%.
 - (c) It will rise by 20%.
 - (d) It will rise by 50%.
 - (e) It will rise by 30%.

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3. The price elasticity of demand for tomatoes is -1 . This month the price of lettuce is \$1 per pound. and the total amount of tomatoes demanded is 1000 truckloads. Next month the price is expected to rise to \$1.60 per pound. If the demand curve does not shift, how many truckloads can we expect to be demanded next month.
- (a) We cannot tell without knowing how many pounds of tomatoes there are in a truckload.
 - (b) 400
 - (c) 1,300
 - (d) 250
 - (e) 950
4. The shrimp harvest was unusually good this year. The demand curve did not shift from last year, but because of the abundant harvest, the price fell from \$100 per sack to \$85 per sack. The price elasticity of demand for shrimp is -1.40 . What happened to the total revenue of fishermen? Choose the closest answer. Hint: The percentage change in revenue is approximately equal to the percentage change in price plus the percentage change in quantity. Finding the answer takes two steps: 1) find percentage change in quantity. 2) find percentage change in revenue.
- (a) It decreased by about 6%.
 - (b) It decreased by about 12%.
 - (c) It decreased by about 48%.
 - (d) It increased by about 6%.
 - (e) It increased by about 36%.
5. The demand curve for bananas is given by the equation $p = 800 - 2q$. At what point on the demand curve is the price elasticity of demand for bananas equal to -1 ?
- (a) Where $p = 400$ and $q = 200$.
 - (b) Where $p = 480$ and $q = 160$.
 - (c) Everywhere along this line.
 - (d) Where $p = 160$ and $q = 320$.
 - (e) Where $p = 240$ and $q = 280$.

ANSWER KEY
Economics 1

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- 1 A
 - 2 D
 - 3 B
 - 4 D
 - 5 A