

## Discussion 4

### 1 Topics

- Elasticity

### 2 Elasticity Problems

#### Exercise 1

Suppose demand is given by  $Q = 10 - P$ .

1. Suppose the price is originally at \$4 and increases to \$5. Using these two points, and the regular percentage change formula, calculate price elasticity of demand.
2. Now suppose the price falls from \$5 to \$4. Again using the regular percentage formula, calculate price elasticity of demand. What problem is apparent given your answers to this and the previous part?
3. Using the mid-point formula, calculate the price elasticity of demand between \$4 and \$5. What is the advantage of this formula? Is demand elastic or inelastic?
4. Calculate the revenue to a firm in this market if the price is set at \$4 and \$5.
5. Repeat parts (3) and (4) using the prices \$8 and \$9. Make a conjecture about the relationship between price elasticity and the effect of increasing price on revenue. What will be the elasticity at the revenue maximizing price?

**Exercise 2**

The following table gives part of the demand schedule for widgets in the USA:

Price	1	3	5
Quantity Demanded	18	10	4

1. Calculate the price elasticity of demand as the price increases from \$1 to \$3 using the mid-point formula. What happens to the total revenue as a result of the price increase?
2. Calculate the price elasticity of demand as the price increases from \$3 to \$5 using the mid-point formula. What happens to the total revenue as a result of the price increase?

**Exercise 3**

Suppose demand for Donuts in Madison is given by  $P = 120 - 3Q$

1. Calculate the price elasticity of demand at  $P = 30$ . What adjustment should be made to the price to increase total revenue?
2. Calculate the price elasticity of demand at  $P = 90$ . What adjustment should be made to the price to increase total revenue?
3. Calculate the price and quantity at which the total revenue is maximized. What is the maximum revenue that can be obtained?

### 3 Multiple Choice Questions

**Exercise 4** Which of the following statements is true?

- (a) The price elasticity of demand for downward-sloping linear demand is constant across all points on the demand curve.
- (b) With a perfectly elastic demand curve, increasing price increases total revenue.
- (c) With a unitary elastic demand curve, increasing price increases total revenue.
- (d) On the inelastic part of a demand curve, increasing price increases total revenue.

**Exercise 5** Which of the following statements is true?

Table 1: Multiple Choice Question 2



- (a) Point B is more elastic than point D.
- (b) At point C, elasticity is 0.
- (c) All points are elastic.
- (d) None of the above.

**Exercise 6** Consider the market for peanut butter and jars of jelly. Suppose that the price elasticity of demand for peanut butter is -2, and that there is a 10% drop in the quantity demanded for peanut butter following a change in price. What is the price change?

- (a) A 10% decrease in price
- (b) A 5% decrease in price
- (c) A 10% increase in price
- (d) A 5% increase in price

**Exercise 7** Following from the previous exercise, now suppose that the cross-price elasticity of demand for jelly in response to a change in price for peanut butter is -3. What is the change in demand for jelly?

- (a) A 15% decrease in the demand for jelly
- (b) A 5% decrease in the demand for jelly
- (c) A 15% increase in the demand for jelly
- (d) A 5% increase in the demand for jelly

**Exercise 8** Alice is a book lover and she says, “I always spend half of my monthly salary on books regardless of the price.” We can conclude that her demand for books is

- (a) elastic
- (b) inelastic
- (c) unitary elastic
- (d) perfectly inelastic

**Exercise 9** Suppose the government imposed an effective price floor on a good. If the government raises the effective price floor, the total revenue

- (a) would increase
- (b) would decrease
- (c) would remain unchanged
- (d) may increase, decrease, or remain unchanged

**Exercise 10** Suppose the government imposed an effective price ceiling on a good. If the government raises the effective price ceiling, the total revenue

- (a) would increase
- (b) would decrease
- (c) would remain unchanged
- (d) may increase, decrease, or remain unchanged