

Worksheet On Elasticity Answers Key

Elasticity

1. TheNile.com, the online bookseller, wants to increase its total revenue. Currently, every book it sells is priced at \$10.50. One suggested strategy is to offer a discount that lowers the price of a book to \$9.50, a 10% reduction in price using the midpoint method. TheNile.com knows that its customers can be divided into two distinct groups according to their likely responses to the discount. The accompanying table shows how the two groups respond to the discount.

	Group A (sales per week)	Group B (sales per week)
Volume of sales before the 10% discount	1.55 million	1.50 million
Volume of sales after the 10% discount	1.65 million	1.70 million

- Using the midpoint method, calculate the price elasticities of demand for Group A and Group B.
- Explain how the discount will affect total revenue from each group.
- Suppose TheNile.com knows which group each customer belongs to when he or she logs on and can choose whether or not to offer the 10% discount. If TheNile.com wants to increase its total revenue, should discounts be offered to Group A or to Group B, to neither group, or to both groups?

1. a. Using the midpoint method, the percent change in the quantity demanded by Group A is

$$\frac{1.65 \text{ million} - 1.55 \text{ million}}{(1.55 \text{ million} + 1.65 \text{ million})/2} \times 100 = \frac{0.1 \text{ million}}{1.6 \text{ million}} \times 100 = 6.25\%$$

and since the change in price is 10%, the price elasticity of demand for Group A is

$$\frac{6.25\%}{10\%} = 0.625$$

Using the midpoint method, the percent change in the quantity demanded by Group B is

$$\frac{1.7 \text{ million} - 1.5 \text{ million}}{(1.5 \text{ million} + 1.7 \text{ million})/2} \times 100 = \frac{0.2 \text{ million}}{1.6 \text{ million}} \times 100 = 12.5\%$$

and since the change in price is 10%, the price elasticity of demand for Group B is

$$\frac{12.5\%}{10\%} = 1.25$$

- For Group A, since the price elasticity of demand is 0.625 (demand is inelastic), total revenue will decrease as a result of the discount. For Group B, since the price elasticity of demand is 1.25 (demand is elastic), total revenue will increase as a result of the discount.
 - If TheNile.com wants to increase total revenue then it should definitely not offer the discount to Group A and it should definitely offer the discount to Group B.
2. Do you think the price elasticity of demand for Ford sport-utility vehicles (SUVs) will increase, decrease, or remain the same when each of the following events occurs? Explain your answer.
- Other car manufacturers, such as General Motors, decide to make and sell SUVs.

Worksheet on elasticity answers key is a crucial resource for students and educators focusing on the concept of elasticity in economics. Elasticity measures how much the quantity demanded or supplied of a good responds to changes in price, income, or other factors. Understanding elasticity is essential for making informed decisions in both business and policy-making. This article will delve into the various types of elasticity, how to interpret and solve elasticity problems, and provide a comprehensive answers key to common elasticity questions found in worksheets.

Understanding Elasticity

Elasticity can be categorized into several types, including:

1. Price Elasticity of Demand (PED)

Price elasticity of demand measures how much the quantity demanded of a good responds to a change in its price. It is calculated using the following formula:

$$\text{PED} = \frac{\text{Percentage Change in Quantity Demanded}}{\text{Percentage Change in Price}}$$

- If $\text{PED} > 1$, demand is elastic.
- If $\text{PED} < 1$, demand is inelastic.
- If $\text{PED} = 1$, demand is unitary elastic.

2. Price Elasticity of Supply (PES)

Price elasticity of supply measures how much the quantity supplied of a good responds to a change in its price. The formula is similar to that of PED:

$$\text{PES} = \frac{\text{Percentage Change in Quantity Supplied}}{\text{Percentage Change in Price}}$$

- If $\text{PES} > 1$, supply is elastic.
- If $\text{PES} < 1$, supply is inelastic.
- If $\text{PES} = 1$, supply is unitary elastic.

3. Income Elasticity of Demand (YED)

Income elasticity of demand measures how much the quantity demanded of a good changes as consumer income changes. The formula is:

$$\text{YED} = \frac{\text{Percentage Change in Quantity Demanded}}{\text{Percentage Change in Income}}$$

- If $\text{YED} > 1$, the good is a luxury.
- If $\text{YED} < 1$, the good is a necessity.
- If $\text{YED} = 0$, the good is inferior.

4. Cross Elasticity of Demand (XED)

Cross elasticity of demand measures how the quantity demanded of one good responds to a change in the price of another good. The formula is:

$$\text{XED} = \frac{\text{Percentage Change in Quantity Demanded of Good A}}{\text{Percentage Change in Price of Good B}}$$

- If $\text{XED} > 0$, the goods are substitutes.
- If $\text{XED} < 0$, the goods are complements.

Why Elasticity Matters

Understanding elasticity is vital for several reasons:

- **Pricing Strategies:** Businesses can use elasticity to set prices that maximize revenue.
- **Taxation Policies:** Governments consider elasticity when imposing taxes to predict how much revenue they will generate.
- **Consumer Behavior:** Understanding how consumers react to price changes can help businesses in product development and marketing strategies.
- **Economic Forecasting:** Elasticity helps economists predict the effects of economic changes on supply and demand.

Solving Elasticity Problems

When working with elasticity problems, students often encounter various scenarios. Here's how to approach these problems step by step:

Step 1: Identify the Type of Elasticity

Determine whether the problem involves price elasticity of demand, price elasticity of supply, income elasticity, or cross elasticity.

Step 2: Gather Required Information

Make sure you have the necessary data, such as initial and new prices, quantities sold, and income levels.

Step 3: Use the Appropriate Formula

Apply the relevant formula based on the type of elasticity you are calculating.

Step 4: Interpret the Results

After calculating the elasticity, interpret the result to understand the relationship between price, quantity, and demand.

Worksheet on Elasticity: Sample Problems and Answers Key

Below is a selection of common elasticity problems along with their answers to help you understand how to apply the concepts discussed.

Sample Problem 1: Price Elasticity of Demand

A product's price increases from \$10 to \$12, and the quantity demanded decreases from 100 units to 80 units. Calculate the price elasticity of demand.

Solution:

1. Percentage change in quantity demanded = $\left[\frac{80 - 100}{100} \right] \times 100 = -20\%$
2. Percentage change in price = $\left[\frac{12 - 10}{10} \right] \times 100 = 20\%$
3. PED = $\left[\frac{-20\%}{20\%} \right] = -1$

Interpretation: The demand is unit elastic.

Sample Problem 2: Price Elasticity of Supply

The price of a good rises from \$15 to \$20, and the quantity supplied increases from 50 units to 70 units. Calculate the price elasticity of supply.

Solution:

1. Percentage change in quantity supplied = $\left[\frac{70 - 50}{50} \right] \times 100$

$$= 40\%$$

$$2. \text{ Percentage change in price} = \left[\frac{20 - 15}{15} \right] \times 100 = 33.33\%$$

$$3. PES = \left[\frac{40\%}{33.33\%} \right] \approx 1.2$$

Interpretation: The supply is elastic.

Sample Problem 3: Income Elasticity of Demand

If a consumer's income increases from \$30,000 to \$35,000 and the quantity demanded for a luxury car increases from 20 to 30 units, calculate the income elasticity of demand.

Solution:

$$1. \text{ Percentage change in quantity demanded} = \left[\frac{30 - 20}{20} \right] \times 100 = 50\%$$

$$2. \text{ Percentage change in income} = \left[\frac{35,000 - 30,000}{30,000} \right] \times 100 = 16.67\%$$

$$3. YED = \left[\frac{50\%}{16.67\%} \right] = 3$$

Interpretation: The good is a luxury since $YED > 1$.

Sample Problem 4: Cross Elasticity of Demand

If the price of coffee rises from \$5 to \$6 and the quantity demanded for tea increases from 100 to 130 units, calculate the cross elasticity of demand.

Solution:

$$1. \text{ Percentage change in quantity demanded of tea} = \left[\frac{130 - 100}{100} \right] \times 100 = 30\%$$

$$2. \text{ Percentage change in price of coffee} = \left[\frac{6 - 5}{5} \right] \times 100 = 20\%$$

$$3. XED = \left[\frac{30\%}{20\%} \right] = 1.5$$

Interpretation: Coffee and tea are substitutes since $XED > 0$.

Conclusion

The **worksheet on elasticity answers key** not only provides solutions but also reinforces the understanding of elasticity concepts, enabling students to apply these principles effectively. By mastering elasticity, students can enhance their analytical skills in economics, which are invaluable in various real-world applications. Whether for academic purposes or professional use, a solid grasp of elasticity can lead to better decision-making and strategic planning in economics and business.

Frequently Asked Questions

What is elasticity in economics?

Elasticity in economics refers to the responsiveness of quantity demanded or quantity supplied to changes in price or other factors, such as income or the price of related goods.

How can I find an answers key for a worksheet on elasticity?

You can often find an answers key for a worksheet on elasticity by checking educational resources online, teachers' websites, or academic forums. Alternatively, you can create your own answers by solving the problems step-by-step.

What types of elasticity are commonly covered in worksheets?

Common types of elasticity covered in worksheets include price elasticity of demand, price elasticity of supply, income elasticity of demand, and cross-price elasticity of demand.

Why is understanding elasticity important for students?

Understanding elasticity is important for students because it helps them analyze how changes in market conditions affect consumer behavior and business decisions, which is crucial for making informed economic choices.

Can you provide an example of a question typically found on an elasticity worksheet?

A typical question might be: 'If the price of a product increases by 10% and the quantity demanded decreases by 20%, what is the price elasticity of demand?' The answer would involve calculating the elasticity as $-20\% / 10\% = -2$, indicating elastic demand.

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