

2.2 Price elasticity, income elasticity and cross elasticity of demand

Name: _____ Class: _____ Date: _____ **Total: 19 marks**

KEY WORDS elasticity of demand 需求弹性 • price elasticity of demand 需求价格弹性
• cross elasticity of demand 需求交叉弹性 • total revenue 总收益 • cross (xed) 交叉弹性

Objective

Build the skills to answer exam questions on **elasticity of demand** 需求弹性 — **price (PED)** 价格弹性, **income (YED)** 收入弹性 and **cross (XED)** 交叉弹性 elasticity, their formulae, and the link between **PED and total revenue** 总收益.

You must be able to:

- calculate and interpret PED, YED and XED
- classify goods (elastic/inelastic; normal/inferior; substitute/complement)
- analyse the link between PED and total revenue

1 Worked examples

■ The three elasticities

$PED = \frac{\% \Delta Q_d}{\% \Delta P}$ · steeper D = more inelastic

inelastic demand

price

P_1

P_2

small rise in Q

quantity

elastic demand

price

P_1

P_2

large rise in Q

quantity

Inelastic: quantity barely moves; elastic: quantity moves a lot

$PED = \frac{\% \Delta Q_d}{\% \Delta P}$ $YED = \frac{\% \Delta Q_d}{\% \Delta Y}$ $XED = \frac{\% \Delta Q_{d,A}}{\% \Delta P_B}$

- **PED:** price +10%, quantity -25% → $\frac{-25}{10} = -2.5$ → **elastic** (ignore the sign).
- **YED:** income +20%, demand +30% → +1.5 → **normal**, a **luxury** 奢侈品 (>1).
- **XED:** tea price +10%, coffee +4% → +0.4 → **substitutes** 替代品 (positive).
- **TR link:** if demand is inelastic, a price **rise** raises total revenue; if elastic, a price **fall** raises it.

Answer shapes: AO1 + AO2 + AO3 (analysis) + AO4 (judgement, for evaluate questions).

2 Practice

2.1 Define *price elasticity of demand (PED)*. [2]

2.2 The price of a good falls by 5% and quantity demanded rises by 15%. Calculate the PED and classify the demand. [2]

2.3 A 10% rise in income causes a 4% fall in demand for a good. Calculate the YED and classify the good. [2]

3 Exam-style questions

3.1 A good has a PED of 0.4. To raise total revenue, the firm should: [1]

- **A** lower the price
- **B** raise the price
- **C** keep the price the same
- **D** stop producing the good

3.2 When the price of good B rises by 20%, the demand for good A rises by 5%.

(a) Calculate the cross elasticity of demand (XED). [2]

(b) State, with a reason, the relationship between goods A and B. [2]

3.3 Discuss the usefulness of price elasticity of demand to a firm setting its prices. [8]

Solutions

Economics answers are marked by **level of response** against the assessment objectives: award **AO1** knowledge, **AO2** application, **AO3** analysis and **AO4** evaluation.

2.1 a measure of how much the quantity demanded responds to a change in the good's price, equal to $\% \Delta Q_d \div \% \Delta P$ (2 for a clear definition; 1 for a partial idea).

2.2 $PED = \frac{+15}{-5} = -3$; ignoring the sign, $3 > 1$, so demand is **elastic** (2; award 1 for a correct value with no classification).

2.3 $YED = \frac{-4}{+10} = -0.4$; negative, so the good is **inferior** (2; award 1 for a correct value with no classification).

3.1 B. With PED 0.4 (inelastic), raising the price raises total revenue.

3.2 (a) $XED = \frac{+5}{+20} = +0.25$ (2; award 1 for a correct method with the wrong figure).

(b) positive XED, so A and B are **substitutes** — a rise in B's price makes buyers switch to A (2 for relationship + reason; 1 for relationship only).

3.3 [8] AO1/AO2/AO3 up to 5 + AO4 up to 3. **Useful:** PED predicts how a price change affects quantity and total revenue, helping the firm price for maximum revenue and judge a tax or discount. **Limits:** PED values come from estimates, change over time, and assume ceteris paribus; rivals may react. Judgement: PED is a valuable guide for pricing, but only alongside knowledge of costs and competitors — its usefulness depends on how reliable the estimate is.