

Exercise walk-through

Price elasticity, income elasticity and cross elasticity of demand ■ 2.2

eXercise

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

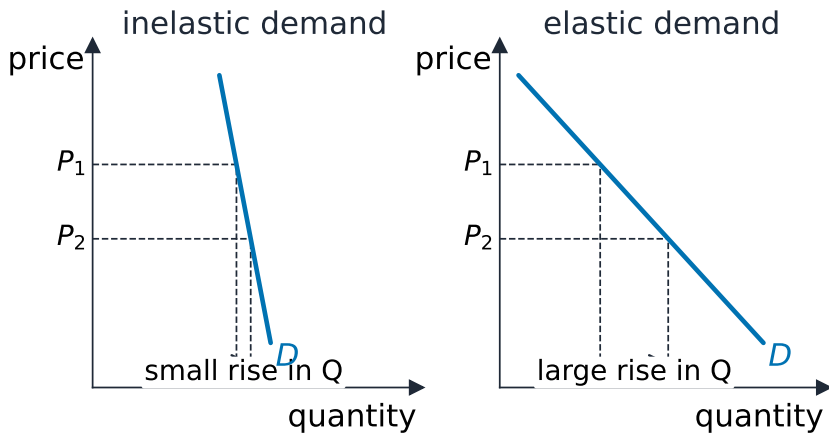
Method — The three elasticities

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

- **PED:** price +10%, quantity −25% → $\frac{-25}{10} = -2.5 \rightarrow$ **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).

Method — The three elasticities



Inelastic (steep) vs elastic (shallow) demand

Practice 2.1 ■ 2 marks

Define *price elasticity of demand (PED)*.

Solution 2.1

Method: The three elasticities

Worked steps

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).

Practice 2.2 ■ 2 marks

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

Solution 2.2

Method: The three elasticities

Worked steps

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

Practice 2.3 ■ 2 marks

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

Solution 2.3

Method: The three elasticities

Worked steps

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

Exam-style 3.1 ■ 1 mark

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

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

Solution 3.1

Method: The three elasticities

A lower the price

B raise the price



C keep the price the same

D stop producing the good

Worked steps

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

Exam-style 3.2 ■ 2 marks

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

Solution 3.2

Method: The three elasticities

Worked steps

- (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).

Exam-style 3.3 ■ 8 marks

Discuss the usefulness of price elasticity of demand to a firm setting its prices.

Solution 3.3

Method: The three elasticities

Worked steps

[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.