



ECO.MIC10 Income and Cross Elasticities of Demand

AQA 7136 · Calculators not allowed · about 60 minutes

Total Marks

Name: _____ Date: ____ / ____ / ____

Answer all questions in full sentences where required. Show all working for calculations. Total time guidance 60 minutes.

- 1 Define the income elasticity of demand (YED) and state the formula, in the context of a household's response to income changes.

(Total for Question 1 is 1 mark)

- 2 Define the cross elasticity of demand (XED) and state the formula, in the context of two goods such as tea and coffee.

(Total for Question 2 is 1 mark)

- 3 Calculate the income elasticity of demand for a luxury fashion brand in the UK market where average household income rises from GBP 20,000 to GBP 24,000 and quantity demanded rises from 50 units to 65 units. Use whole-number arithmetic and show working.

(Total for Question 3 is 3 marks)

- 4 Classify the following goods by income elasticity using the table: Good A has $YED = 0.4$; Good B has $YED = 2$; Good C has $YED = -1$. For each good, state whether it is inferior, a necessity, or a luxury and give a one line reason relating magnitude to the classification.

(Total for Question 4 is 3 marks)

- 5 Calculate the cross elasticity of demand between coffee and tea when the price of tea rises from GBP 10 to GBP 12 and the quantity demanded of coffee increases from 200 cups to 240 cups. State whether they are substitutes or complements.

(Total for Question 5 is 2 marks)

- 6 Calculate the cross elasticity of demand between printers and ink cartridges when the price of printers rises from GBP 80 to GBP 100 and the quantity demanded of ink cartridges falls from 500 units to 400 units. State the sign and classification.

(Total for Question 6 is 2 marks)

- 7 State briefly what a negative XED implies about the relationship between two goods, in the context of cars and petrol.

(Total for Question 7 is 1 mark)

- 8** Data extract for analysis, named category: instant noodles in a UK recession. Extract: Average household income falls by 10% during a mild recession. Sales data show quantity demanded of instant noodles rises from 1,200 packs per week to 1,320 packs per week. Analyse how this change in income affects demand for instant noodles. Use calculations and discuss what this implies for the classification of instant noodles and the likely implications for firms selling them. (Answer worth 8 marks.)

(Total for Question 8 is 8 marks)

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- 9** If a good has $YED = 0.6$, state whether it is a necessity or a luxury and give a brief explanation using the magnitude.

(Total for Question 9 is 1 mark)

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- 10** If two goods have $XED = 0.3$, state whether they are strong substitutes, weak substitutes or complements and give a one line justification.

(Total for Question 10 is 1 mark)

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- 11** Explain briefly one way a firm selling a complementary good (for example, a smart-phone case seller) might change its pricing strategy if the price of the related good (smartphones) falls sharply.

(Total for Question 11 is 1 mark)

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- 12** Essay question on XED and pricing behaviour for firms selling complements, named examples allowed.

Discuss the extent to which cross elasticity of demand (XED) explains the pricing behaviour of firms selling complementary goods, using examples such as printers and ink or gaming consoles and games. In your answer, consider the role of magnitude and sign of XED, market power, strategic pricing, and limitations of XED as a predictor. You should reach a supported conclusion.

(Total for Question 12 is 12 marks)

Mark scheme · ECO.MIC10 Income and Cross Elasticities of Demand

Question 1

- **B1** a measure of how the quantity demanded of a good responds to a change in consumers' income, calculated as percentage change in quantity demanded divided by percentage change in income
- **Answer: YED = % change in quantity demanded / % change in income, measuring how demand responds to income changes.**

Question 2

- **B1** a measure of how the quantity demanded of one good responds to a change in the price of another good, calculated as percentage change in quantity demanded of good A divided by percentage change in price of good B
- **Answer: XED = % change in quantity demanded of good A / % change in price of good B, measuring the relationship between two goods.**

Question 3

- **M1** calculate % change in income = $(24000 - 20000) / 20000 \times 100 = 20\%$
- **M1** calculate % change in quantity = $(65 - 50) / 50 \times 100 = 30\%$
- **A1** YED = $30\% / 20\% = 1.5$, indicating a luxury good (YED > 1)
- **Answer: YED = 1.5 (30% / 20%), so the fashion brand is a luxury good.**

Question 4

- **B1** Good A: YED = 0.4, classified as a necessity because $0 < \text{YED} < 1$
- **B1** Good B: YED = 2, classified as a luxury because YED > 1
- **B1** Good C: YED = -1, classified as an inferior good because YED < 0
- **Answer: A necessity (0.4, $0 < \text{YED} < 1$); B a luxury (2, YED > 1); C inferior (-1, YED < 0).**

Question 5

- **M1** calculate % change in price of tea = $(12 - 10) / 10 \times 100 = 20\%$; % change in coffee demand = $(240 - 200) / 200 \times 100 = 20\%$
- **A1** XED = $20\% / 20\% = 1.0$, positive so coffee and tea are substitutes
- **Answer: XED = 1.0, positive; coffee and tea are substitutes.**

Question 6

- **M1** calculate % change in price of printers = $(100 - 80) / 80 \times 100 = 25\%$; % change in ink demand = $(400 - 500) / 500 \times 100 = -20\%$
- **A1** XED = $-20\% / 25\% = -0.8$, negative so printers and ink are complements
- **Answer: XED = -0.8, negative; printers and ink cartridges are complements.**

Question 7

- **B1** negative XED implies the goods are complements: an increase in the price of one reduces demand for the other, e.g. higher petrol prices reduce demand for car travel
- **Answer: Negative XED means the goods are complements, so a price rise in one reduces demand for the other.**

Question 8

- **Level 1** (1-2): Simple calculation or assertion with minimal development, for example a correct percentage change calculated with little or no interpretation.
- **Level 2** (3-5): Correct calculation and basic interpretation, linking the sign of YED to classification, with one development or consequence for firms.
- **Level 3** (6-8): Detailed calculation, clear classification as inferior good, and analysis of firm implications including pricing, demand stability and possible strategic responses, with evidence from the data.
- **Indicative content:**
 - Calculate % change in income = -10%
 - Calculate % change in quantity = $(1320 - 1200) / 1200 \times 100 = +10\%$
 - $YED = +10\% / -10\% = -1.0$, negative value indicates instant noodles are an inferior good in this data
 - Interpretation: as income falls, demand rises; magnitude of 1.0 implies a unitary negative response, fairly responsive to income changes
 - Implications for firms: demand for instant noodles may rise during recessions, suggesting countercyclical sales and potential for stable revenues or targeted marketing to capture increased demand
 - Further analysis: firms might avoid price increases during recessions, consider cost leadership, increase distribution to discount retailers, and anticipate supply adjustments; consider limitations such as short-term vs long-term classification and that other factors could influence demand

Question 9

- **B1** $YED = 0.6$ indicates a necessity because $0 < YED < 1$, so demand rises with income but less than proportionately
- **Answer: Necessity; 0.6 is between 0 and 1 so demand rises with income but less proportionately.**

Question 10

- **B1** $XED = 0.3$ indicates weak substitutes because $XED > 0$ but the small magnitude shows only a weak positive relation
- **Answer: Weak substitutes; positive but small XED (0.3) indicates a weak substitution effect.**

Question 11

- **B1** the firm might raise its price slightly to capture extra consumer surplus because lower smartphone prices increase demand for cases, but must balance with competitive pressures and elasticity of demand for the complement
- **Answer: They may raise price slightly because greater smartphone sales increase demand for cases, but must consider competition and elasticity so price rises are limited.**

Question 12

- **Level 1** (1-3): Basic statements about complements and pricing with little use of economic reasoning, few or no examples, and no clear judgement.
- **Level 2** (4-6): Clear explanation that negative XED indicates complements and some link to pricing behaviour, with limited development or a single example, and an attempted conclusion.
- **Level 3** (7-9): Well developed discussion linking sign and magnitude of XED to likely pricing responses, consideration of market power and strategic pricing (e.g. game consoles priced low, games priced higher), and evaluation of factors that weaken XED as a predictor, with balanced examples.
- **Level 4** (10-12): Comprehensive evaluation: detailed analysis of how XED, including its magnitude, helps explain but does not fully determine pricing; integrates market structure, strategic bundling, two-part tariffs, market power, production costs and behavioural factors; weighs evidence and limitations and arrives at a supported, nuanced conclusion.
- **Indicative content:**
 - Define XED and recall that negative XED indicates complements; magnitude matters because a large negative XED implies a strong complementary relationship and greater likely impact on pricing
 - Explain the direct prediction: if two goods are strong complements, a firm selling one may consider the price of the other when setting its own price to maximise joint profits
 - Examples: printers and ink where firms may price printers low (even at marginal profit) and make profits on ink (razor and blades model), gaming consoles subsidised with higher game prices or licensing fees, consoles and exclusive games being sold as complementary bundles
 - Consider market power: firms with monopoly power in one complement can influence the market price of the other, e.g. a console maker with control over game distribution can affect game prices; where many small firms sell the complement, XED matters less for any single firm's pricing
 - Strategic pricing beyond XED: two-part tariffs, bundling, loss-leading and versioning can be used to extract consumer surplus and are not predicted solely by XED
 - Limitations of XED as a predictor: XED is a partial equilibrium, ceteris paribus measure and does not capture cost structures, demand asymmetries, switching costs, habit, brand loyalty, nor dynamic strategies; measurement issues and time horizons mean short-run XED can differ from long-run relationships
 - Evaluate empirical considerations: firms may respond differently depending on whether XED is small or large in magnitude; a small negative XED may lead to little strategic price interdependence, while a large negative XED encourages close coordination or bundled offers
 - Conclude with a balanced judgement: XED gives useful information about the degree of interdependence in demand and hence possible pricing interactions for complements, but firms also consider market power, costs, competition and strategic factors, so XED alone only partially explains pricing behaviour