1.13 Income and Cross Elasticities of Demand

Total Marks

AQA 7136 · Calculators not allowed · about 60 minutes · Write-in edition

Name: _____ Date: ____ / ____ / _____

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

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

(Total for Question 3 is 1 mark)

4 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 4 is 1 mark)

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5 A supermarket's value-range pasta sold 500 packs a week when average household income was £2,000 a month. When average household income rose to £2,400 a month, sales fell to 450 packs a week. Calculate the income elasticity of demand for the pasta and state what it shows about the good. Show your working.

(Total for Question 5 is 3 marks)

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6 The income elasticity of demand for a restaurant's tasting menus is +2.5. Average household income is expected to rise by 6%. The restaurant currently sells 4,000 tasting menus a month. Calculate the expected change in quantity demanded, as a percentage, and the new monthly sales. Show your working.

(Total for Question 6 is 3 marks)

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

(Total for Question 7 is 3 marks)

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8 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 8 is 3 marks)

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

(Total for Question 9 is 2 marks)

10 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 10 is 8 marks)

11 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 11 is 12 marks)

Mark scheme · 1.13 Income and Cross Elasticities of Demand

Question 1

XED = 0.3 indicates weak substitutes because XED > 0 but the small magnitude shows only a weak positive relation **B1**

Answer: Weak substitutes; positive but small XED (0.3) indicates a weak substitution effect.

Question 2

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 **B1**

Answer: XED = % change in quantity demanded of good A / % change in price of good B, measuring the relationship between two goods.

Question 3

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 **B1**

Answer: Negative XED means the goods are complements, so a price rise in one reduces demand for the other.

Question 4

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 **B1**

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 5

% change in income = (2,400 - 2,000) / 2,000 x 100 = 20% and % change in quantity = (450 - 500) / 500 x 100 = -10% **M1**

YED = -10% / 20% = -0.5 (accept about -0.58 if the mid-point method is used) **A1**

negative YED shows the pasta is an inferior good: demand falls as income rises **B1**

Answer: YED = -0.5 (-10% / 20%), so the pasta is an inferior good.

Question 6

% change in quantity demanded = YED x % change in income = 2.5 x 6 **M1**

+15% **A1**

new sales = 4,000 x 1.15 = 4,600 menus a month **A1**

Answer: Quantity demanded is expected to rise by 15%, so sales rise from 4,000 to 4,600 menus a month.

Question 7

calculate % change in income = (24000 - 20000) / 20000 x 100 = 20% **M1**

calculate % change in quantity = (65 - 50) / 50 x 100 = 30% **M1**

YED = 30% / 20% = 1.5, indicating a luxury good (YED > 1) **A1**

Answer: YED = 1.5 (30% / 20%), so the fashion brand is a luxury good.

Question 8

Good A: YED = 0.4, classified as a necessity because 0 < 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 **B1**

Answer: A necessity (0.4, 0<YED<1); B a luxury (2, YED>1); C inferior (-1, YED<0).

Question 9

calculate % change in price of printers = (100 - 80) / 80 x 100 = 25%; % change in ink demand = (400 - 500) / 500 x 100 = -20% **M1**

XED = -20% / 25% = -0.8, negative so printers and ink are complements **A1**

Answer: XED = -0.8, negative; printers and ink cartridges are complements.

Question 10

Level 1 Simple calculation or assertion with minimal development, for example a correct percentage change calculated with little or no interpretation. **1-2**

Level 2 Correct calculation and basic interpretation, linking the sign of YED to classification, with one development or consequence for firms. **3-5**

Level 3 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. **6-8**

Indicative content:

- Calculate % change in income = -10%
- Calculate % change in quantity = (1320 - 1200) / 1200 x 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 11

Level 1 Basic statements about complements and pricing with little use of economic reasoning, few or no examples, and no clear judgement.	**1-3**
Level 2 Clear explanation that negative XED indicates complements and some link to pricing behaviour, with limited development or a single example, and an attempted conclusion.	**4-6**
Level 3 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.	**7-9**
Level 4 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.	**10-12**

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