1.2 Consumer behaviour, demand and elasticities

Name: _____ Class: _____ Date: _____ **Total: 26 marks**

KEY WORDS price elasticity of demand • total revenue

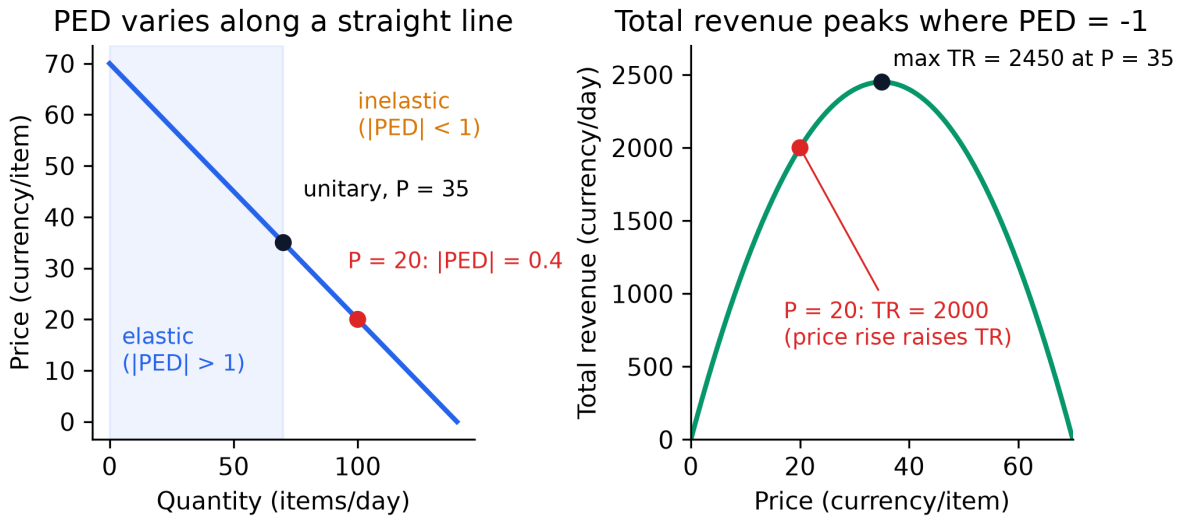
Consumer behaviour, demand and elasticities

Objective

Apply rationality and its limits, movements versus shifts of demand, diminishing marginal utility, and calculate and interpret PED, YED and XED with total revenue (spec 1.3.2, rows 1–3). All calculations use the shared model $Q_d = 140 - 2P$.

1 Key knowledge and worked examples

Demand and elasticities. Rational consumers maximise utility (firms maximise profit), but herding, habit, inertia, computation limits, the need to feel valued and framing bend this. Own-price changes move ALONG the demand curve; substitutes' prices, complements' prices, real income, tastes, population and advertising SHIFT it. PED = %ΔQd ÷ %ΔP; TR = P × Q rises with price exactly when demand is inelastic; along a straight demand curve PED falls from elastic to unitary (midpoint, TR maximised) to inelastic.



Both panels are computed from the shared demand curve.

2 Practice

2.1 State the rationality assumption for consumers and for firms, and give one reason consumers may not maximise utility. [2]

2.2 For each event on the market for tea, state movement along or shift (and direction): (a) the price of tea falls; (b) the price of coffee rises. [2]

2.3 On $Q_d = 140 - 2P$, price rises from 20 to 22. Calculate PED. [3]

2.4 Calculate total revenue at prices 20 and 22, and state what the pair implies about demand. [3]

2.5 Incomes rise by 10% and the quantity of a good demanded rises by 8%. Calculate YED and classify the good. [3]

2.6 The price of good B rises 10% and the quantity demanded of good A rises 10%. Calculate XED and state the relationship. [2]

2.7 Explain, using diminishing marginal utility, why a consumer only buys a second identical item at a lower price. [2]

3 Exam-style questions

3.1 *(Original.)* A firm sells 100 items per day at 20 currency units each on the demand curve $Q_d = 140 - 2P$. Using elasticity, advise the firm on the price that maximises total revenue, showing the revenue at that price. [5]

3.2 *(Original.)* Explain why the price elasticity of demand for a branded medicine is likely to differ from that for salt, naming two factors from the specification. [4]

Solutions

2.1 Consumers maximise utility; firms maximise profit. One limit: herding (others: habit, inertia, poor computation, need to feel valued, framing).

2.2 (a) Movement along the demand curve (a fall in the own price raises quantity demanded). (b) Shift of the demand curve right – coffee is a substitute, so tea becomes relatively more attractive at every tea price.

2.3 At $P = 20$, $Q_d = 100$; at $P = 22$, $Q_d = 96$. $\%\Delta Q = -4\%$, $\%\Delta P = +10\%$, so PED $= -0.4$.

2.4 TR at $20 = 20 \times 100 = 2000$; TR at $22 = 22 \times 96 = 2112$. Revenue rises when price rises, confirming demand is price inelastic ($|PED| = 0.4 < 1$) over this range.

2.5 YED $= 8\% \div 10\% = +0.8$: positive, so a normal good; between 0 and 1, so income inelastic.

2.6 XED $= +10\% \div +10\% = +1.0$: positive, so A and B are substitutes (close ones at this magnitude).

2.7 The second item gives less additional satisfaction than the first (diminishing marginal utility), so the consumer only sacrifices the price if it is lower – this behaviour aggregated gives the downward-sloping demand curve.

3.1 Along a straight demand curve, TR is maximised where $|PED| = 1$. PED $= (dQ/dP)(P/Q) = -2(P/Q)$; setting $-2P/Q = -1$ gives $Q = 2P$, and with $Q = 140 - 2P$: $140 - 2P = 2P$, so $P = 35$ and $Q = 70$. Maximum TR $= 35 \times 70 = 2450$ currency units/day, above the current 2000. Advice: raise price towards 35; beyond it demand is elastic and revenue falls.

3.2 Branded medicine: strong branding and few perceived substitutes make demand inelastic; salt: a tiny share of expenditure, a necessity with many generic versions, is even more inelastic BUT with no branding premium the factors differ – the expected contrast: substitutes available (medicine has chemical alternatives; salt none), branding (medicine yes, salt no), percentage of total expenditure (both small, salt smaller), addictiveness neither, durability: medicine perishable when ill (short-run need) vs salt storable. Any two specification factors applied with a direction earns the marks.

Local review guidance: percentage changes computed before dividing, with the sign convention stated; classifications use the threshold table ($|\text{PED}| = 1$ boundaries); the unitary midpoint located by calculus or by testing prices either side; accept TR tabulation as an alternative method. This is authored classroom guidance.