Elasticities of Demand Problem Set 2 Solutions

Principles of Microeconomics

August 4, 2025

1. (d) – An increase in price leads to a decrease in total revenue if demand is elastic (with respect to price).

2. (d) – The elasticity of a linear demand curve is non-constant.

3. (c) – If the income elasticity of demand is 0.5, the decrease in income between Brobdingnag and Lilliput leads to a proportionately smaller decrease in Q_D. Since Lilliput's income declines more than its quantity demanded relative to Brobdingnag, Lilliput must spend a higher fraction of its income on food.

4. The demand curve is inelastic because if Q_D decreases that means P increases (by the law of demand). If total revenue increases in response to an increase in P, demand must be inelastic.

5. Walt's demand is perfectly inelastic ($\eta = 0$) because he demands the same quantity regardless of price. Jessie's demand is unit elastic ($\eta = 1$) because he spends the same amount regardless of price. That means the revenue generated by sales to Jessie don't change with price. That's only possible if Jessie's demand is unit elastic.

6. (a)   i.

$$\%\Delta Q = \frac{32 - 40}{\frac{32+40}{2}} = -\frac{8}{36} = -\frac{2}{9}$$

$$\%\Delta P = \frac{10 - 8}{\frac{10+8}{2}} = \frac{2}{9}$$

$$\eta = \left| \frac{\%\Delta Q}{\%\Delta P} \right| = 1$$

     ii.

$$\%\Delta Q = \frac{45 - 50}{\frac{45+50}{2}} = \frac{-5}{47.5} = \frac{-10}{95}$$

$$\%\Delta P = \frac{2}{9}$$

$$\eta = \left| \frac{\%\Delta Q}{\%\Delta P} \right| = \frac{90}{190} = \frac{9}{19} \approx 0.47$$

(b)   i.

$$\%\Delta Q = \frac{30 - 24}{\frac{30+24}{2}} = \frac{6}{27} = \frac{2}{9}$$

$$\%\Delta I = \frac{24,000 - 20,000}{\frac{24,000+20,000}{2}} = \frac{4,000}{22,000} = \frac{2}{11}$$

$$IED = \frac{\%\Delta Q}{\%\Delta I} = \frac{\frac{2}{9}}{\frac{2}{11}} = \frac{11}{9} \approx = 1.22$$

ii.

$$\%\Delta Q = \frac{12 - 8}{\frac{12+8}{2}} = \frac{4}{10} = \frac{2}{5}$$

$$\%\Delta I = \frac{2}{11}$$

$$IED = \frac{\%\Delta Q}{\%\Delta I} = \frac{\frac{2}{5}}{\frac{2}{11}} = \frac{11}{5} = 2.2$$