



B.E. International Program

Faculty of Economics, Thammasat University



EE 320 Introductory Mathematical Economics (Section 046402)

Semester 1/2013

Quiz 3 (b)

Given the demand function

$$Q_d = 16 - 4P$$

a) (2 point) Determine the price elasticity of demand when $Q = 4$.

Ans. $Q = 4 \rightarrow P = 3$

$$\varepsilon_d = \frac{\% \Delta Q}{\% \Delta P} = \frac{dQ}{dP} \frac{P}{Q}$$

$$\frac{dQ}{dP} = \frac{d(16-4P)}{dP} = -4$$

$$\text{Thus, } \varepsilon_d = \frac{dQ}{dP} \frac{P}{Q} = (-4) * \frac{3}{4} = -3$$

b) (2 points) Derive the inverse demand function, i.e. $P = f(Q)$.

Ans. From $Q_d = 16 - 4P$

$$4P = 16 - Q_d$$

$$\Rightarrow P = 4 - \frac{Q_d}{4} \text{ is the inverse demand function.}$$

c) (6 points) Derive the total revenue (TR), average revenue (AR), and marginal revenue (MR) functions.

$$\text{Ans. } P = 4 - \frac{Q_d}{4}$$

$$TR(Q) = P(Q) * Q = 4Q - \frac{Q^2}{4}$$

$$\Rightarrow AR(Q) = \frac{TR(Q)}{Q} = 4 - \frac{Q}{4} = P(Q)$$

$$\Rightarrow MR(Q) = \frac{d[TR(Q)]}{dQ} = 4 - \frac{Q}{2}$$