



B.E. International Program

Faculty of Economics, Thammasat University



EE 320 Introductory Mathematical Economics (Section 046402)

Semester 1/2013

Quiz 3 (a)

Given the demand function

$$Q_d = 15 - 3P$$

a) (2 point) Determine the price elasticity of demand when $Q = 6$.

Ans. $Q = 6 \rightarrow P = 3$

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

$$\frac{dQ}{dP} = \frac{d(15-3P)}{dP} = -3$$

$$\text{Thus, } \varepsilon_d = \frac{dQ}{dP} \frac{P}{Q} = (-3) * \frac{3}{6} = -\frac{3}{2}$$

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

Ans. From $Q_d = 15 - 3P$

$$3P = 15 - Q_d$$

$$\Rightarrow P = 5 - \frac{Q_d}{3} \text{ is the inverse demand function.}$$

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

$$\text{Ans. } P = 5 - \frac{Q}{3}$$

$$TR(Q) = P(Q) * Q = 5Q - \frac{Q^2}{3}$$

$$\Rightarrow AR(Q) = \frac{TR(Q)}{Q} = 5 - \frac{Q}{3} = P(Q)$$

$$\Rightarrow MR(Q) = \frac{d[TR(Q)]}{dQ} = 5 - \frac{2Q}{3}$$