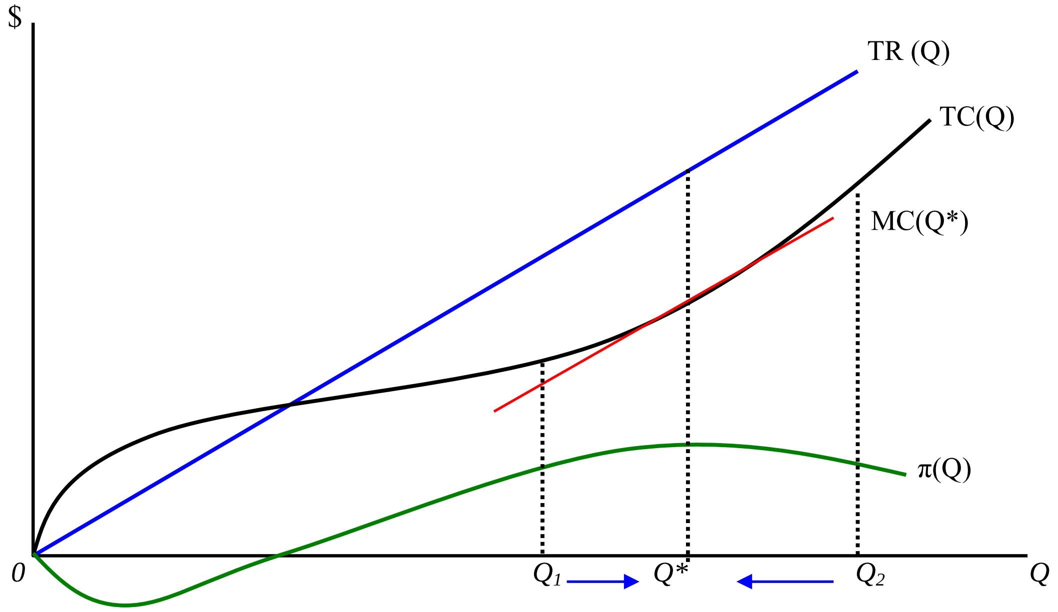
Lecture 06 – Profit Maximization

1. Profit maximizing quantity

$$\boxed{\pi(Q) = TR(Q) - TC(Q)} \qquad (1)$$

(economic profit) = (sales revenue) – (economic costs)
(accounting profit) = (sales revenue) – (accounting costs)



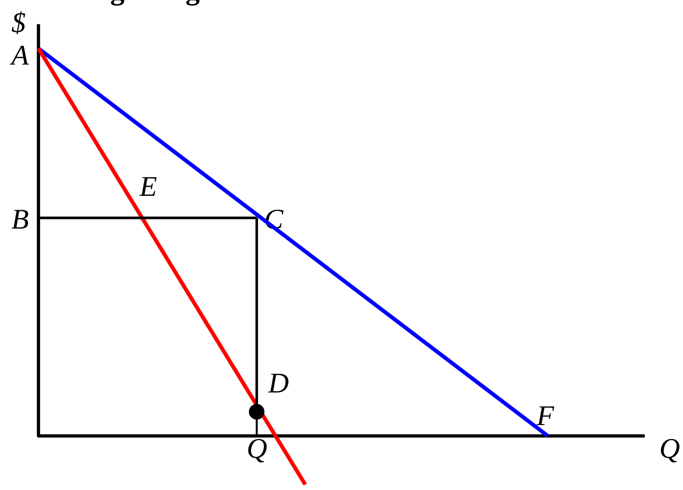
1° : FOC

$$\frac{d\pi(Q)}{dQ} = \frac{dTR(Q)}{dQ} - \frac{dTC(Q)}{dQ} = MR(Q) - MC(Q) = 0, \text{ so } \boxed{MC(Q) = MR(Q)}$$

2°: SOC

$$\frac{d^2\pi(Q)}{dQ^2} = \frac{d^2TR(Q)}{dQ^2} - \frac{d^2TC(Q)}{dQ^2} = TR''(Q) - TC''(Q) < 0. \boxed{MR'(Q) < MC'(Q)}$$

2. Deriving Marginal Revenue Curve



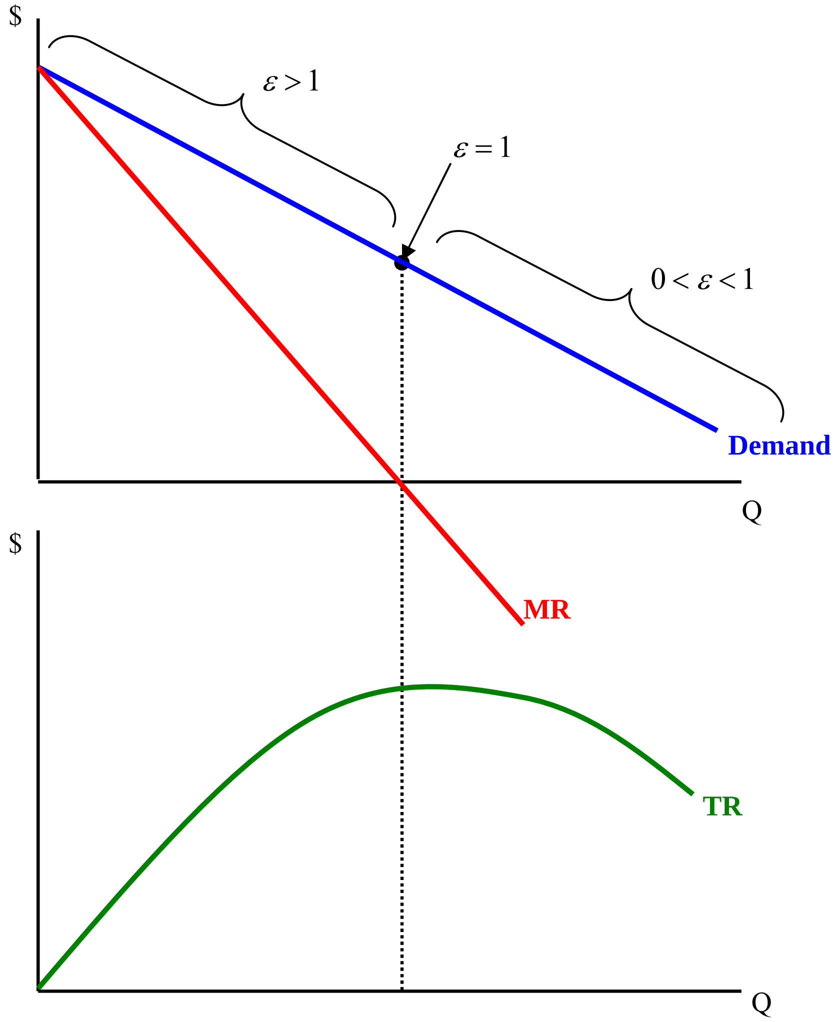
Amoroso-Robinson Formula

$$MR = \frac{dTR}{dQ} = \frac{d(P \cdot Q)}{dQ} = P + Q\frac{dP}{dQ} = P\left(1 + \frac{Q}{P}\frac{dP}{dQ}\right) = P\left(1 - \frac{1}{\varepsilon_D}\right)$$

Since demand curve is downward sloping, ε_D is always positive. Therefore, *MR* is lower than *AR* (average revenue, i.e. Price). $\boxed{MR < P}$.

If $\varepsilon_D = \infty$ (horizontal demand, infinitely elastic demand, or *Q = 0*), $MR = AR(= P)$.

3. Marginal Revenue, Price Elasticity and Total Revenue



4. Profit Maximization: Revisited

a) Oversimplification problem
b) Any alternative ways?
c) Asymmetric Information