Chapter 11

Monopoly

Key Concepts

- Monopolist means one supplier and his supply of the product influence the demand curve. The monopolist faces a downward slopped demand curve.
- Monopolist's inverse demand curve: $p = D(q)$, which is downward slopping means higher is q lower is the p, see Figure 11.1(b), compare with competitive firm's inverse demand curve in Figure 11.1(a): price is p for all supply levels.
- Revenue: $R(q) = p.q = D(q).q$ (since p depends on q for a monopolist as mentioned above)
- As before profit, $\pi(q)$ = Revenue –cost = $R(q) – C(q)$
- As before, profit is maximized at that q where $\pi'(q) = 0$.
- *i.e.*, $MR(q) = MC(q)$: the rule that determines the monopoly's profit-maximizing output.
- Graphically and analytically: Solve monopolists profit maximizing output level q, price p, and maximized profit, compare with a competitive firm's solution.

Figure 11.1
Average and Marginal Revenue

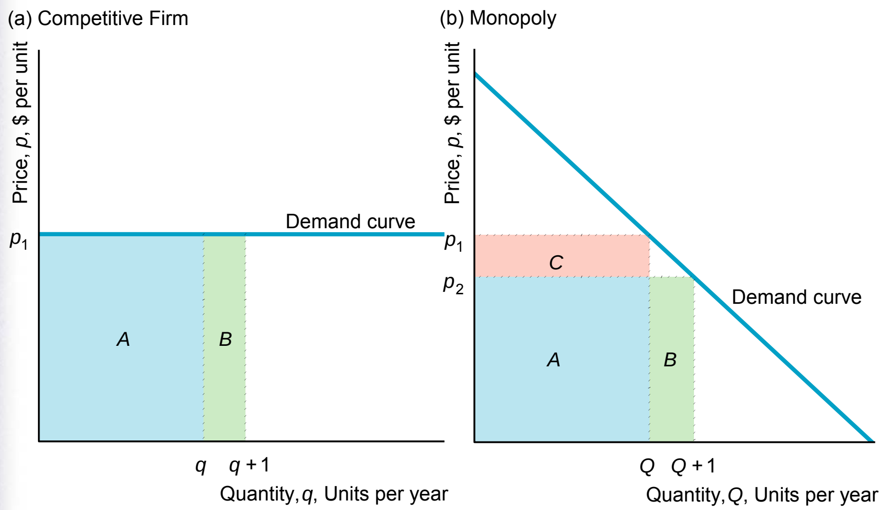


Figure 11.3
Maximizing Profit

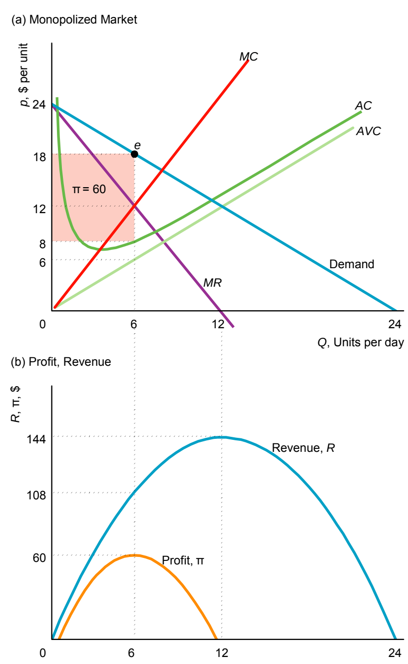
MR(q) = MC(q) is attained at q = 6.
The monopolist supply q = 6.

He charges p = 18 (i.e. D(6), D(.) is the inverse demand function.

Average cost to produce q = 6 is 8

Maximized profit is the shaded area

= 60.



Analytically

- Inverse demand curve of the monopolist: $p = D(q)$, take $D(q) = 10 - 2q$
- Cost function: $C(q) = 25 – 10q + 0.5 q^2$
- Revenue: $R(q) = p.q = .D(q).q = (10 - 2q).q$
- Thus $R(q) = 10q - 2q^2$
- Condition for profit maximization is $MR(q) = MC(q)$, i.e., $R'(q) = C'(q)$. Compute each term for the above specifications, equate them and solve for q.

Example (continued)

- $R'(q) = 10 – 4q$
- $C'(q) = -10 + q$
- MR = MC => $10-4q = -10 + q$ (solve for q)
- $5q = 20 \Rightarrow q = 4$.
- What price does the monopolist charge?
- Use the inverse demand curve $p = D(q)$, substitute the above q to find p. Ans: $p = 2$
- Maximized Profit: Directly calculate revenue and cost at the above price $p = 2$ and quantity $q = 4$,
- Profit = $p.q – C(q) = 8 – C(4) = 8 –(25 – 40 +.5*16) = 15$.