EC3322
Industrial Organization I
Semester 1, 2015-2016
Tutorial #2

SOLUTIONS

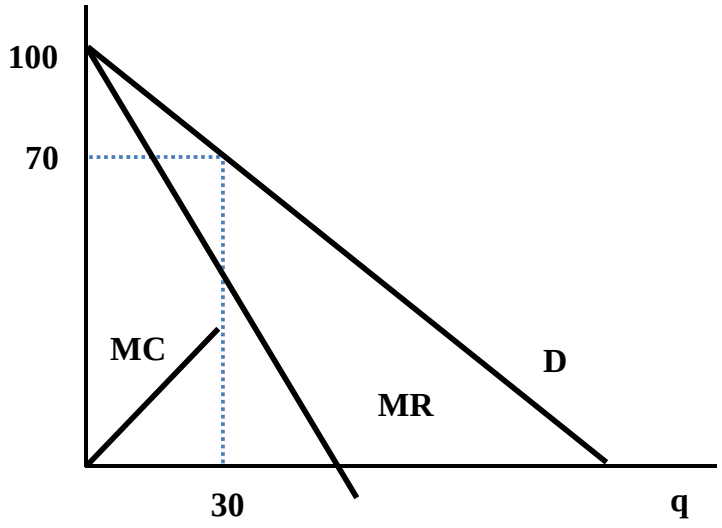
2. $q^M = 5$ and $p^M = 25$. The Lerner index is

$$L = \frac{p^M - mc}{p^M} = \frac{p^M - 2q^M}{p^M} = \frac{25 - 10}{25} = \frac{3}{5}.$$

3. (a) Since $MR > MC$ for $Q \leq 30$, the firm finds it profitable to provide $Q^* = 30$. Substitute Q^* into the inverse demand function to find price is $P^* = 70$.

   (b) Since the willingness to pay is greater than MC for $Q \leq 30$, the social planner will also provide $Q^W = 30$. Therefore, deadweight loss is zero.

   (c) See graph below.



4. (a) In the long run, a firm chooses quantity such that $P = MC$ as long as P is greater than or equal to the minimum average cost. Find the minimum average cost by setting the derivative of the average cost function with respect to q equal to zero and solving for q, which is $q = 5$ at an average cost of 30. Thus, the supply function of a fringe firm in the long run is

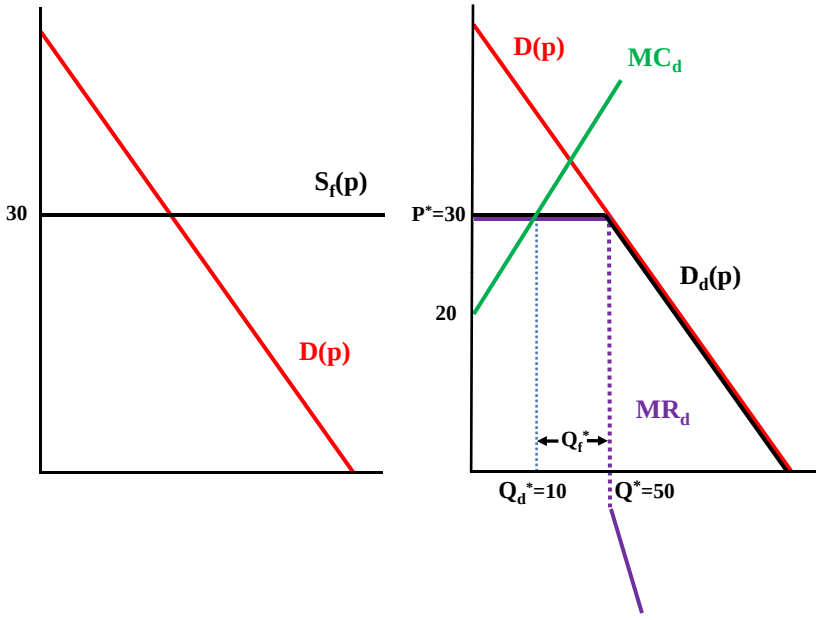
$$q_f = \begin{cases} \dfrac{p-20}{2} & , \quad p \geq 30 \\ 0 & , \quad p < 30. \end{cases}$$

(b) Long run aggregate supply of the fringe is horizontal at the minimum AC, 30.

(c) The dominant firm's demand is horizontal at $P = 30$. Below 30, it is equal to market demand.

(d) The MC of the dominant firm is $MC = 20+q$. Notice from the graph that it crosses the horizontal part of residual demand. Therefore, $P^* = 30$ and the number of units purchased is $Q^* = 50$. Of these, 10 units are sold by the dominant firm with the remaining 40 are sold by the fringe.

(e)



5. (a) Aggregate demand is

$$Q = \begin{cases} 100 - 2p & , \quad 40 \leq p \leq 50 \\ 180 - 4p & , \quad p < 40 \end{cases}$$

and marginal revenue is

$$MR = \begin{cases} 50 - Q & , \quad Q < 20 \\ 45 - .5Q & , \quad 20 \leq Q \leq 180. \end{cases}$$

(b) The marginal cost curve crosses the lower portion of the marginal revenue curve. Solve to find $Q^* = 80$ and $P^* = 25$.

(c) Derive marginal revenue and set it equal to the marginal cost to find $Q_E^* = 45$ and $P_E^* = 55/2$.

(d) Again, derive marginal revenue and set it equal to the marginal cost to find $Q_S^* = 35$ and $P_S^* = 45/2$.