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

SOLUTIONS

2. (a) $CR_4 = 3 \times 20 + 10 = 70$
   (b) $HHI = 4 \times 10^2 + 3 \times 20^2 = 1,600$
   (c) $HHI = 3 \times 10^2 + 2 \times 20^2 + 30^2 = 2,000$
   (d) $\Delta HHI = 2,000 - 1,600 = 400$
   (e) The merger should be challenged since none of the three cases are satisfied.

3. To help solve this problem you can use the fact that HHI increases as the market becomes more concentrated, i.e., as firm market shares increase. So the two extreme cases in this problem are: 1. both firms have a market share of 20 and 2. one firm has a market share of 40 and the other a market share of 0. In the first case, HHI is 2000. In the second case, it is 2800.

4. b, 5. c

6. The elasticity as a function of Q is

$$\varepsilon = \frac{dQ}{dP}\frac{P}{Q} = -\frac{100 - Q}{Q}.$$

   Set the expression equal to -1 to find $Q = 50$.

7. In the long run, the firm will supply a positive amount of output so long as price is greater than or equal to: **$56.** (This is the minimum AC.)

8. The long-run equilibrium firm output is the q for which AC = MC (where AC is minimized):

$$AC = MC \Rightarrow \frac{400}{q} + 5 + q = 5 + 2q \Rightarrow q^* = 20$$

   Equilibrium price is found by substituting q^* into the optimality condition:

$$p = MC \Rightarrow p = 5 + 2 * 20 \Rightarrow p^* = 45$$

   Total output is found by substituting p^* into the demand function:

$$Q^* = 265 - 45 = 220$$

   The number of firms is determined by dividing market output by firm output:

$$n = Q/q \Rightarrow n = 220/20 \Rightarrow n^* = 11$$