

# IN-CLASS ASSIGNMENT: Monopoly

Monday, April 27<sup>th</sup> 2015

5 points

Name: ANSWER KEY

1. A monopoly faces the following demand and total cost function:

$$Q_D = 200 - 2P$$
$$TC = 5Q$$

$$\frac{2P}{2} = \frac{200 - Q_D}{2}$$
$$P = 100 - \frac{1}{2}Q_D$$

- a. What level of output,  $Q$ , maximizes profit?

$$MR = MC$$

$$\text{Revenue} = (100 - \frac{1}{2}Q_D)Q_D \quad ; \quad MR = 100 - Q_D$$
$$MC = 5$$

$$100 - Q_D = 5$$

$$Q_D = 95$$

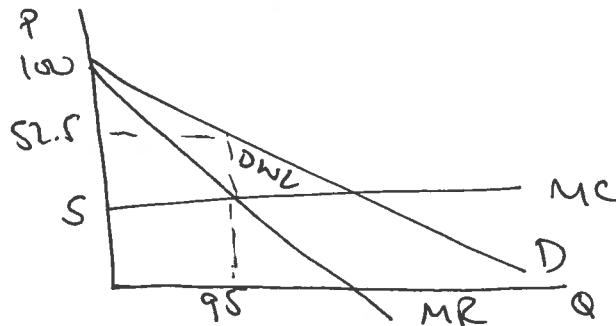
- b. What is the profit maximizing price?

$$P = 100 - \frac{1}{2}(95) = 52.5$$

- c. What is the maximum profit for the firm?

$$\pi = PQ - C(Q)$$
$$= 52.5(95) - 5(95) = 4512.5$$

- d. Graph the firm's optimal price and quantity on a graph, making sure to include the marginal revenue, marginal cost, and demand curves.



2. Use the Lerner index,  $\frac{p-mc}{p} = -\frac{1}{\epsilon_D}$ , to solve for the elasticity of demand of a product when a retailer pay the wholesale price of \$7 for that good, but then charges the retail price of \$14.

$$\frac{14-7}{14} = -\frac{1}{\epsilon_D}$$

$$0.5 = -\frac{1}{\epsilon_D} \quad \therefore$$

$$\epsilon_D = -2 \quad \therefore \text{elastic}$$