

KEY

1. (4 pts.) You run a golf course in Mount Sterling, KY called Old Silage. You have two types of customers, out-of-town golfers and local golfers. The marginal cost of serving either type of golfer is \$10. Elasticity of demand for out-of-towners is 1.50, while elasticity of demand for locals is 2.33. What price should you charge each type of customer in order to maximize profits? Explain how you get your answer.

1. Inverse elasticity rule: $\frac{P - MC}{P} = \frac{1}{\epsilon_{x, P}}$

out-of-town golfers: $\epsilon_o = 1.5 = \frac{3}{2}$

$$\frac{P - 10}{P} = \frac{1}{3/2}; \quad P - 10 = \frac{2}{3}P; \quad \frac{1}{3}P = 10$$

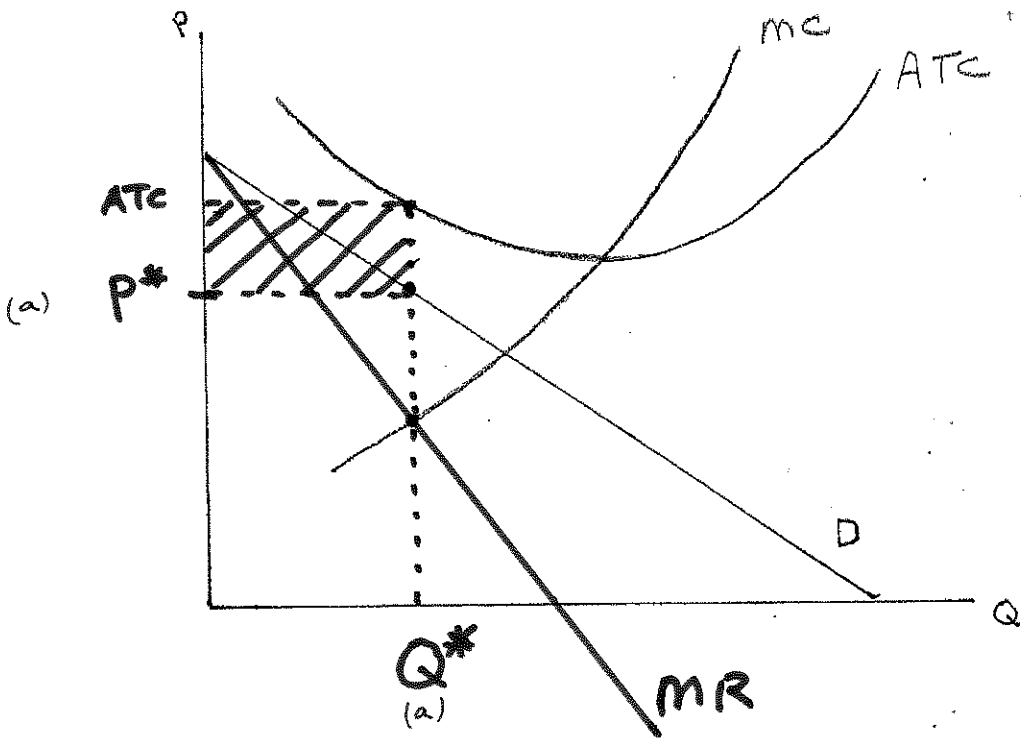
$$\therefore P_o^* = \$30$$


local golfers: $\epsilon_L = 2.33 = \frac{7}{3}$

$$\frac{P - 10}{P} = \frac{1}{7/3}; \quad P - 10 = \frac{3}{7}P; \quad \frac{4}{7}P = 10$$

$$\therefore P_L^* = \$17.50$$

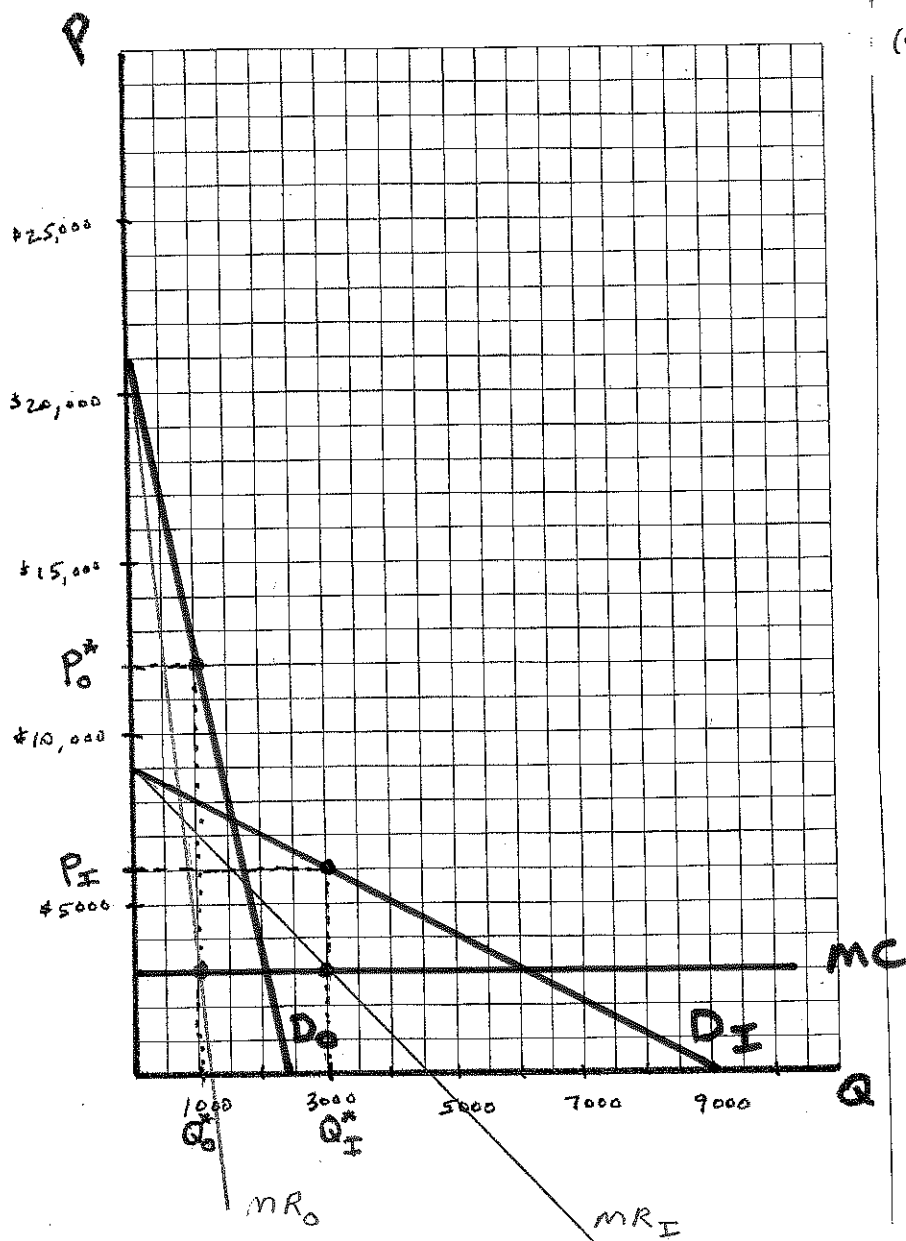
2. (6 pts.) For many years since graduating from the Gatton College, you have operated a fast-food business in the food court area of a major shopping mall. Inspired by one of your professors, you chose a roast beef theme for your menu. Based on your own experience and that of other fast food businesses in the mall, you conclude that the typical restaurant in this mall is experiencing the same market conditions as you, which are (partially) illustrated in the diagram below.
- Illustrate the optimal price and output for your restaurant, given the demand and cost curves shown on the diagram.
 - Illustrate the economic profits or losses and explain what advice you would have for the owner of this mall concerning the amount of space allocated for fast food firms versus clothing and other types of retail stores.



(b) $P < ATC$ at Q^* , so economic losses of .

Too many restaurants in the mall! Mall owner should convert some of that space to shoe stores and other retail outlets.

3. (8 pts.) Each year a new group of high school seniors chooses where they want to attend college. The University of Kentucky faces two identifiably different categories of customers, in-state and out-of-state students. The (inverse) demand equation for in-state students is given by $P_I = \$9000 - Q_I$, while demand by out-of-state students is given by $P_O = \$21,000 - 9Q_O$. P represents the annual tuition charged by UK and Q represents the number of students who enter as freshmen. The marginal cost of educating an additional student is constant and equal to \$3000. Suppose that the Board of Trustees wants to act as a profit-maximizing monopolist in setting price and output. What tuition should they charge for in-state and out-of-state students, and how many of each would enroll each year? Illustrate your answer in the diagram below.



(a) In-state: D_I

$$Q_I^* \text{ where } MR_I = MC$$

$$\text{or } Q_I^* = 3000$$

$$\text{and } P_I^* = \$6000$$

(b) Out-of-state: D_O

$$Q_O^* \text{ where } MR_O = MC$$

$$\text{or } Q_O^* = 1000$$

$$\text{and } P_O^* = \$12,000$$