

1. (16 pts) A monopolist faces market demand curve of:  $P = 970 - 20Q$  and the monopolist has two plants, one in Greenville:  $MC_G = 10$  and one in Wilson:  $MC_W = 1 + 0.5Q_W$ .

a) Graph the market supply curve for this monopolist.

b) Find this monopolist's profit-maximizing price and total output.

c) How much does monopolist produce at the Greenville and Wilson plants?

2. (20 pts) The monopolist has demand curve:  $P = 20 - 2Q$  and total cost:  $TC = Q^2 + 2Q + 20$

a. Find the perfectly price discriminating quantity.

b. Find the perfectly price discriminating producer surplus. On a graph, lightly shade the producer surplus area.

3. (4 pts) For the demand curve:  $Q = 50 - \frac{1}{2} P$  and  $MC = Q$ .

a. Find the monopolist price and quantity.

b. Find the deadweight loss for the monopolist. Lightly shade the deadweight loss area on a graph.

4. For a perfectly competitive firm with demand curve:  $Q = 100 - P$  and  $MC = 3Q$ .
- a. Find the price and quantity.

- b. Lightly shade in the area of consumer surplus on a graph. How much is consumer surplus?

5. (8 pts) Given the market demand is:  $Q^d = 18 - P^d$  where  $Q^d$  is quantity demanded and the price consumers pay is  $P^d$ . The supply curve is:  $Q^s = P^s - 2$  where  $Q^s$  is quantity supplied and  $P^s$  is the price producers receive.

a. In a competitive market find equilibrium price and quantity.

b. If the government implements a \$4 excise tax, find the after-tax equilibrium  $P^s$ ,  $P^d$ , and quantity.

6. (8 pts) Given the demand curve:  $P = 100 - Q$  and  $MC = 10$ .

a. Find the equilibrium price and quantity in a perfectly competitive market if the government imposes a price ceiling of \$20.

b. Find the equilibrium price and quantity in a perfectly competitive market if the government imposes a price floor of \$20.

7. (8 pts) The paper industry consists of 10 producers, all of which have identical short-run total cost functions:  $STC(Q) = Q^2 + 4Q + 20$ . The market demand curve for paper is:  $D(P) = 106 - 2P$ .
- Find the short-run market supply curve.
  - Find the equilibrium price and quantity in this industry.
8. (4 pts) The battery industry is perfectly competitive. Each battery maker has a long-run marginal cost curve:  $MC(Q) = 20 - 4Q + 1.5Q^2$ . The long-run average cost function is:  $AC(Q) = 20 - 2Q + 0.5Q^2$  for each firm. The market demand for batteries is  $D(P) = 500 - 10P$ .
- What is the long-run equilibrium price for batteries?
  - At this price, how many would an individual firm produce?
  - How many firms are in the battery market in a long-run equilibrium?

9. (12 pts) Determine the degree of price discrimination (1<sup>st</sup>, 2<sup>nd</sup> or 3<sup>rd</sup> degree) in the following scenarios:
- ECU students get 15% off at Scott's Cleaners.
  - The U.S. government auctions off the Statue of Liberty via a sealed bid process, the highest bidder wins the auction and pays the 2<sup>nd</sup> highest bid amount.
  - Krispy Kreme sells donuts: 1 for \$0.65, 3 for \$1 and 12 for \$2.
  - Carmike12 offers a daily matinee for \$5 all seats before 6pm. After 6pm the price is \$7 for adults.
  - The Hyatt reduces its room rate for AARP members.
10. The price elasticity of demand for fireworks in South Carolina is  $-1.50$  and the price elasticity of demand for fireworks is  $-0.75$  in North Carolina. Which state will have higher firework prices? Why?
11. A perfectly competitive firm has a short-run production function given by  $Q = 10L^{0.5}$ . The price of L is \$1. If the price of the final product is \$4, how much labor will the firm use?

12. For the utility function:  $U(x,y) = x^{0.6}y^{0.4}$ , the price of X = \$2 and the price of Y = \$1 and income = \$100. Find the optimal consumption levels of X and Y.

13. Given the demand curve:  $P = 100 - 2Q$   
a. Find the choke price.

b. What is the price elasticity of demand at  $P = \$20$ ?

c. Explain in words so that a non-economist can understand what the price elasticity number you calculated in (b) means.