

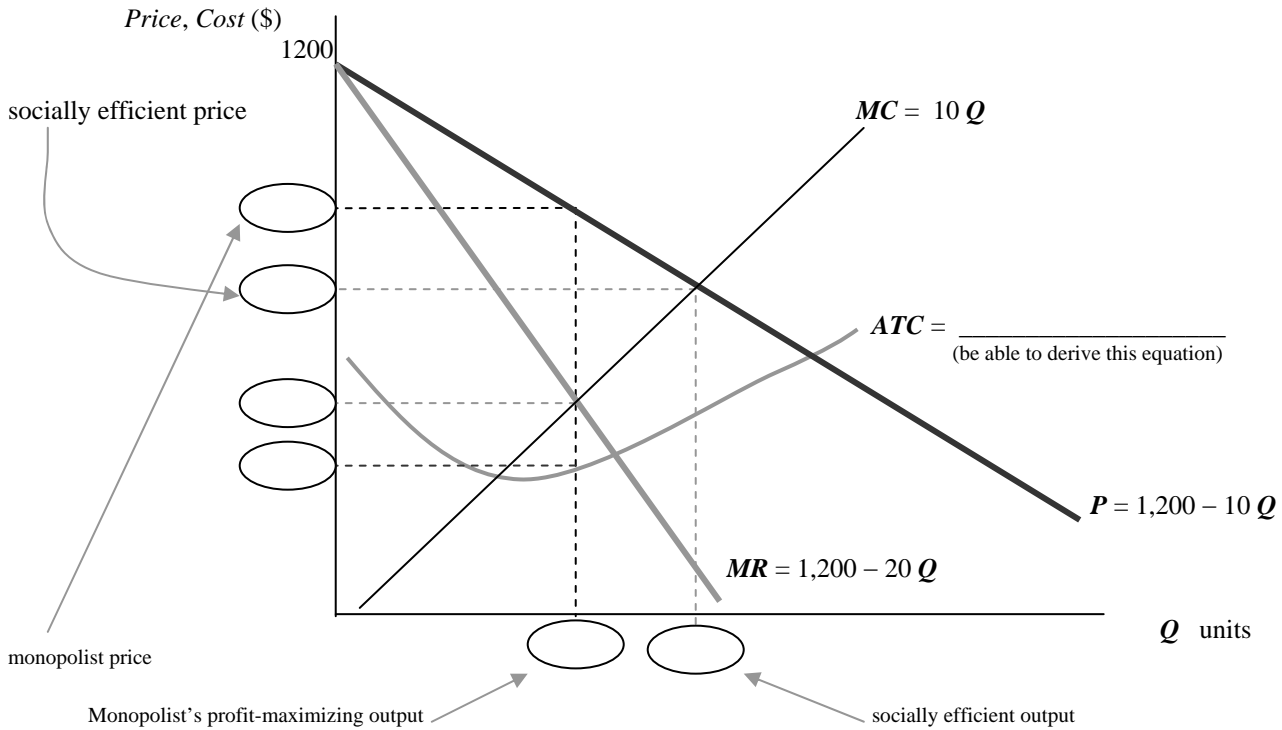
**Microeconomics**  
**Ch. 15 Monopoly and Price Discrimination** (*Practice Problem*)

Consider a monopolist below in Fig. 1 with the following cost curves (*not drawn to scale*):

Total Cost:

$TC = 1,000 + 5Q^2$

Fig. 1. The Cost Curves of a Monopolist



1. What is the profit-maximizing level of output  $Q$  for the monopolist?  
 (*Hint: Set  $MR = MC$  and solve for  $Q$ .*)

$Q = \underline{\hspace{2cm}}$  units  
 (*Answer: 40 units*)

2. At the profit-maximizing output  $Q$ , what price  $P$  is the monopolist charging for its product? Monopolist price,  $P = \$ \underline{\hspace{2cm}}$   
 (*It's the price on the demand curve corresponding to the monopolist's profit-maximizing level of output  $Q$ .*) (\$800)  
 (*Hint: Plug  $Q$  from the previous problem into the demand equation and solve for  $P$ .*)

3. Given its profit-maximizing  $Q$ , how much is the monopolist's profit,  $\pi$ ? Monopolist profit,  $\pi = \$ \underline{\hspace{2cm}}$   
 (\$23,000)  
 (*Hint: First solve for total cost  $TC$  given  $Q$  from the previous problems, which should be \$9,000, then subtract from total revenue  $(P)(Q)$ .)*

4. If the monopoly firm were run *not* by a profit-maximizing owner but by a benevolent social planner, one who would produce at a level of  $Q$  equivalent to that of a perfectly competitive output, what would this output be (called *socially efficient quantity*,  $Q$ )?  
 (Hint: Set  $MC = P$  and solve for  $Q$ .)

Socially efficient  $Q =$  \_\_\_\_\_  
 (perfectly competitive output) (60 units)

5. How much would this benevolent social planner charge as its price if it is producing the socially efficient output  $Q$ ?  $P = \$$  \_\_\_\_\_  
 (Hint: Plug  $Q$  from the previous problem into the demand equation and solve for  $P$ .) (\$600)

6. Following from the two previous questions above, what would be the profit,  $\pi$ , under this situation?  $\pi = \$$  \_\_\_\_\_  
 (\$17,000)

(Hint: First solve for total cost  $TC$  given  $Q$  from the previous problems, which should be \$19,000, then subtract from total revenue  $(P)(Q)$ .)

7. Compare the three outcomes in terms of output  $Q$ , price  $P$  and profit  $\pi$  (one under a monopoly (uniform pricing) condition, another under a perfectly competitive condition, and still another under a monopoly (perfect price discrimination condition)).

	<b>Monopoly</b> (uniform pricing)	<b>Perfect Competition</b> (socially efficient)	<b>Monopoly</b> (perfect price discrimination)
Output, $Q$ (units)	_____ (40 units)	_____ (60 units)	_____ (60 units)
Price charged, $P$ (\$)	_____ (\$800)	_____ \$600	_____ (reservation price)
Profit, $\pi$ (\$)	_____ (\$23,000)	_____ (\$17,000)	_____ (\$35,000)
Consumer Surplus, (\$)	_____ (\$8,000)	_____ (\$18,000)	_____ (0)
Producer Surplus, (\$)	_____ (\$24,000)	_____ (\$18,000)	_____ (\$36,000)
Total Surplus, (\$)	_____ (\$32,000)	_____ (\$36,000)	_____ (\$36,000)
Deadweight Loss, (\$)	_____ (\$4,000)	_____ (0)	_____ (0)