1. If demand is inelastic, marginal revenue exceeds average revenue. (Hint: Average revenue is total revenue divided by quantity).

Answer: False

Total revenue is price times quantity
average revenue is therefore equal
to price, which exceeds marginal
revenue.

2. If the marginal revenue from selling one more unit is greater than the marginal cost of producing that unit, then a monopolist can increase its profits by increasing its output.

Answer: True

Profit equals total revenue minus total cost. If marginal revenue exceeds marginal cost, an increase in output will increase revenue more than it will increase cost. Thus, profits will increase.

3. A monopolist practicing perfect price discrimination sells fewer units than a monopolist that charges a single price.

Answer: False

A monopolist practicing perfect price discrimination charges a price to each customer that is equal to the customer's buyer value, provided that buyer value is greater than marginal cost. Thus, such a monopolist sells to every customer whose buyer value exceeds or equals marginal cost which is exactly what happens under perfect competition.

4. A monopolist faces a demand function that can be described by the equation P=505-15Q where P is the price that the monopolist charges per unit of output and Q is the number of units that the monopolist can sell at that price. The monopolist's total costs are 25Q and its marginal cost is 25. The following expression expresses the monopolist's profit as a function of the number of units sold:

(a) 505-15Q-25
(b) 505-30Q
(c) 480Q-15Q^2
(d) 505Q-15Q^2-15
(e) None of the above

(Note Q^2 means Q-squared.)
(Hint: Profit is Total Revenue Minus Total Cost)

Answer: C

Profit = total revenue minus total cost

$= P \cdot Q - 25Q$

$= (505 - 15Q) \cdot Q - 25Q$

$= 480Q - 15Q^2$

5. The monopolist found in the previous problem has a marginal revenue curve that is described by the equation (where MR stands for marginal revenue):

(a) MR=505-15Q
(b) MR=505-25Q
(c) MR=520+25Q
(d) MR=505-30Q
(e) MR=530-40Q

Answer: D

If demand is $P = a - bQ$, marginal revenue is $MR = a - 2bQ$. In this problem, $a = 505$ and $b = 15$. Thus

$$MR = 505 - 30Q$$

6. Where quantity is measured on the horizontal axis and dollars on the vertical axis, the marginal cost curve of the monopolist of the previous two problems is

(a) an upward-sloping line through the origin with slope 25.
(b) a horizontal line at a height of $25.
(c) a vertical line at a quantity of 21.
(d) an upward-sloping line through the origin with slope 50.
(e) a vertical line at quantity 16

Answer: B

The answer is in question 4, but it is useful to think this through. Suppose cost = 500 + 25 q. Then marginal cost is 25 because an increase in q of one unit will increase cost by 25. The number 500 is irrelevant. It doesn't change as quantity changes.

7. In order to maximize its profits, the monopoly of the preceding questions should sell a quantity of

(a) 32 units
(b) 16 units
(c) 166.67 units
(d) 83.33 units
(e) 40 units

(Hint: For what quantity does marginal revenue equal marginal cost?)

Answer: B

$MR = 505 - 30q$

$MC = 25$

$MR = MC \Rightarrow 505 - 30q = 25$

$480 = 30q$

$16 = q$

To find price go back to demand function, $P = 505 - 15q$. Plug in 16 for q which gives $P = 505 - 15 \cdot 16$

$P = 265$

8. Bozoworks, a software company, has exclusive rights to sell the game Space Morons. Bozoworks spent $2500 getting the program ready to market. Its only remaining costs are the cost of distributing the copies of Space Morons to buyers. This costs $5 per copy. If Bozoworks sells Q copies, its total costs will be $2500+5Q. Nobody is willing to pay more than $90 for a copy of Space Morons. If Bozoworks offers to sell Space Morons at price p, all buyers with buyer values of p or greater will buy and all buyers with buyer values below p will not buy. There are 37 demanders who have buyer values of $90 for a copy of Space Morons. For every dollar that the price falls below $90, Space Morons picks up one more buyer. Thus there is 1 demander with buyer value $89, one with buyer value $88, one with buyer value $87, and so on. Bozoworks' marginal revenue from increasing its sales from 37 to 38 is:

(a) $90
(b) $3,330
(c) $45
(d) $52
(e) $180

Answer: D

If Bozoworks wants to increase sales from 37 to 38, it must decrease price from $90 to $89. The increase in revenue from this is $89 - ($90 - $89)37 = $52

9. Which of the following formulas gives the highest price at which Bozoworks can sell Q copies of Space Morons, where 37<Q<127?

(a) P=90-2Q
(b) P=127-Q
(c) P=90-2Q
(d) P=90-Q
(e) None of the above

Answer: B

For each one-unit increase in quantity, price must fall by $1. Thus the general form of the demand function is $P = a - Q$, where a is an unknown constant. We also know that if $P = \$90$, $Q = 37$. Plugging those values into the general formula, we have

$$90 = a - 37 \quad \text{or} \quad a = 127.$$

So the formula is $P = 127 - Q$

10. Fox Cable is the only television cable company in Santa Barberia. Twenty families are willing to pay $50 per month for cable television, 40 are willing to pay $40 per month, 40 families are willing to pay $25 per month, and 75 families are willing to pay $10 per month. The cost of providing cable service to a house is $20 per month. If Fox Cable were able to practice perfect price discrimination, how much profit could it make per month?

(a) $1,600
(b) $2,000
(c) $1,200
(d) $600
(e) $200

Answer: A

Fox would charge each family a price equal to its buyer value, provided that buyer value exceeds or equals the cost of providing service. Thus, the families with buyer values exceeding $20 would have service. Below is a table of profits from those families

BV	#	Price	Profit/ Family	Profit for group
$50	20	$50	$30	$600
$40	40	$40	$20	$800
$25	40	$25	$5	$200
			Total	$1,600