

Answers (Practice: Monopoly) (Krugman and Wells, 2009)

### Question 3

**a.** In a perfectly competitive industry, each firm maximizes profit by producing the quantity at which price equals marginal cost. That is, all firms together produce a quantity  $S$ , corresponding to point  $R$ , where the marginal cost curve crosses the demand curve. Price will be equal to marginal cost,  $E$ .

**b.** Consumer surplus is the area under the demand curve and above price. In part a, we saw that the perfectly competitive price is  $E$ . Consumer surplus in perfect competition is therefore the triangle  $ARE$ .

**c.** A single-price monopolist produces the quantity at which marginal cost equals marginal revenue, that is, quantity  $I$ . Accordingly, the monopolist charges price  $B$ , the highest price it can charge if it wants to sell quantity  $I$ .

**d.** The single-price monopolist's profit per unit is the difference between price and the average total cost. Since there is no fixed cost and the marginal cost is constant (each unit costs the same to produce), the marginal cost is the same as the average total cost. That is, profit per unit is the distance  $BE$ . Since the monopolist sells  $I$  units, its profit is  $BE$  times  $I$ , or the rectangle  $BEHF$ .

**e.** Consumer surplus is the area under the demand curve and above the price. In part c, we saw that the monopoly price is  $B$ . Consumer surplus in monopoly is therefore the triangle  $AFB$ .

**f.** Deadweight loss is the surplus that would have been available (either to consumers or producers) under perfect competition but that is lost when there is a single-price monopolist. It is the triangle  $FRH$ .

**g.** If a monopolist can price-discriminate perfectly, it will sell the first unit at price  $A$ , the second unit at a slightly lower price, and so forth. That is, it will extract from each consumer just that consumer's willingness to pay, as indicated by the demand curve. It will sell  $S$  units, because for the last unit, it can just make a consumer pay a price of  $E$  (equal to its marginal cost), and that just covers its marginal cost of producing that last unit. For any further units, it could not make any consumer pay more than its marginal cost, and it therefore stops selling units at quantity  $S$ .

### Question 4

a.

Price of download	Quantity of downloads demanded	TR	MR
\$10	0	\$0	
8	1	8	\$8
6	3	18	5
4	6	24	2
2	10	20	-1
0	15	0	-4

b. Bob would charge \$0. At that price, there would be 15 downloads, the largest quantity they can sell.

c. Bill would charge \$4. At that price, total revenue is greatest (\$24). At that price, there would be 6 downloads.

d. Ben would charge \$6. At that price, there would be 3 downloads. For any more downloads, marginal revenue would be below marginal cost, and so further downloads would lose the Baxters' money.

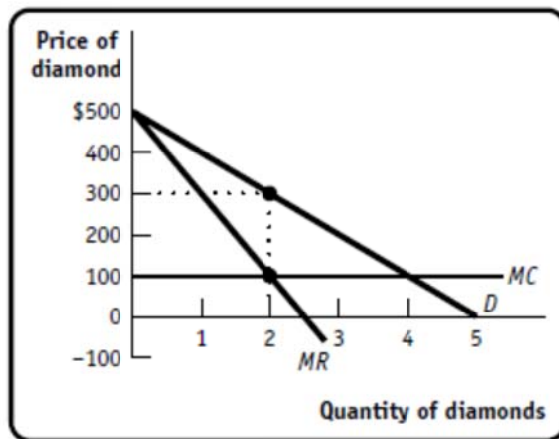
e. Brad would charge \$4. A price equal to marginal cost is efficient. At that price, there would be 6 downloads.

### Question 6

- a. Total revenue and marginal revenue are given in the accompanying table

Price of diamond	Quantity of diamonds demanded	TR	MR
\$500	0	\$0	
400	1	400	\$400
300	2	600	200
200	3	600	0
100	4	400	-200
0	5	0	-400

The accompanying diagram illustrates De Beers's demand curve and marginal revenue curve.



- b. De Beers is the only producer of diamonds, so its demand curve is the market demand curve. And the market demand curve slopes downward: the lower the price, the more customers will buy diamonds.
- c. If De Beers lowers the price sufficiently to sell one more diamond, it earns extra revenue equal to the price of that one extra diamond. This is the quantity effect of lowering the price. But there is also a price effect: lowering the price means that De Beers also has to lower the price on all other diamonds, and that lowers its revenue. So the marginal revenue of selling an additional diamond is less than the price at which the additional diamond can be sold.
- d. If the price is \$200, then De Beers sells to Raquel, Jackie, and Joan. If it lowers the price to \$100, it will also sell a diamond to Mia. The price effect is that De Beers loses \$100 (the amount by which it lowered the price) each from selling to Raquel, Jackie, and Joan. So the price effect lowers De Beers's revenue by  $3 \times \$100 = \$300$ . The quantity effect is that De Beers sells one more diamond (to Mia), at \$100. So the quantity effect is to raise De Beers's revenue by \$100.
- e. The marginal cost (MC) curve is constant at \$100, as shown in the diagram. Marginal revenue equals marginal cost at a quantity of 2 diamonds. So De Beers will sell 2 diamonds at a price of \$300 each.