

Homework #8

modifications of Problems 4, 5, 6, 9 and 11 from Ch. 9, p. 228-29
of Krugman/Wells *Microeconomics* (1st ed.)

4. Bob produces DVD movies for sale, which requires only a building and a machine that copies the original movie onto a DVD. Bob rents a building for \$30,000 per month and rents a machine for \$20,000 a month. Those are his fixed costs. His variable cost is given in the accompanying table.

qty. of DVDs	fixed cost		variable cost		total cost		marginal cost
	total	avg.	total	avg.	total	avg.	
0	\$50,000	--	\$0	--		--	--
1,000	\$50,000		\$5,000				
2,000	\$50,000		\$8,000				
3,000	\$50,000		\$9,000				
4,000	\$50,000		\$14,000				
5,000	\$50,000		\$20,000				
6,000	\$50,000		\$33,000				
7,000	\$50,000		\$49,000				
8,000	\$50,000		\$72,000				
9,000	\$50,000		\$99,000				
10,000	\$50,000		\$150,000				

- a. Calculate Bob's average variable cost, average total cost, and marginal cost for each quantity of output.
 - b. There is free entry into the industry: anyone who enters will face the same costs as Bob. Suppose that currently the price of a DVD is \$23. What will Bob's profit be? Is this a long-run equilibrium? If not, what will the price of DVD movies be in the long run?
5. Consider Bob's DVD company described in problem 4. Assume that DVD production is a perfectly competitive industry. In each case, explain your answers.
- a. What is Bob's break-even price? What is his shut-down price?
 - b. Suppose the price of a DVD is \$2. What should Bob do in the short run?
 - c. Suppose the price of a DVD is \$6. What is the profit-maximizing quantity of DVDs that Bob should produce? What will his total profit be? Will he produce or shut down in the short run? Will he stay in the industry or exit in the long run?
 - d. Suppose instead that the price of DVDs is \$16. Now what is the profit-maximizing quantity of DVDs that Bob should produce? What will his total profit be now? Will he produce or shut down in the short run? Will he stay in the industry or exit in the long run?
6. Consider again Bob's DVD company described in problem 4.
- a. Draw Bob's marginal cost curve.
 - b. Over what range of prices will Bob produce no DVDs in the short run?
 - c. Draw Bob's individual supply curve.

9. The first sushi restaurant opens in town. Initially people are very cautious about eating tiny portions of raw fish, as this is a town where large portions of grilled meat have always been popular. Soon, however, an influential health report warns consumers against grilled meat and suggests that they increase their consumption of fish, especially raw fish. The sushi restaurant becomes very popular and its profit increases.
- What will happen to the short-run profit of the sushi restaurant? What will happen to the number of sushi restaurants in town in the long run? Will the first sushi restaurant be able to sustain its short-run profit over the long run? Explain your answers.
 - Local steakhouses suffer from the popularity of sushi and start incurring losses. What will happen to the number of steakhouses in the long run? Explain your answer.
11. A new vaccine against a deadly disease has just been discovered. Presently, 55 people die from the disease each year. The new vaccine will save lives, but it is not completely safe. Some recipients die from adverse reactions. The projected effects of the inoculation are given in the accompanying table:

percent of the pop. inoculated	total deaths due to disease	total deaths due to inoculation	marginal benefit of inoculation	marginal cost of inoculation	“profit” of inoculation
0	55	0	--	--	
10	45	0			
20	36	1			
30	28	3			
40	21	6			
50	15	10			
60	10	15			
70	6	20			
80	3	25			
90	1	30			
100	0	35			

- What are the interpretations of “marginal benefit” and “marginal cost” here? Calculate marginal benefit and marginal cost per each 10 percent increase in the rate of inoculation. Write your answers in the table.
- What proportion of the population should optimally be inoculated?
- What is the interpretation of “profit” here? Calculate the profit for all levels of inoculation.