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Economics 201
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Homework #4 (due by 9:00pm on Monday, November 21)

Please submit your answers to this homework through the Assignment link at Blackboard. **No credit will be given for answers submitted in class or emailed to the professor**, *regardless of the excuse.* This includes unique excuses like the police confiscated my computer right before I was going to submit it, excuses like "I lost my Internet", etc. Please note that all submissions are final, again – regardless of the excuse (which includes "I accidentally hit the submit button"). Note that Blackboard allows you to save your answers, but you must hit the "Save and Submit" button to submit your answers. If you are unfamiliar with Blackboard, then it would be a good idea to visit the class page at Blackboard and check out the homework assignments as they are posted.

Please note that when Blackboard grades homework answers, more specifically – answers to the fill-in-the-blank questions – your answer must match exactly with the answer that Blackboard is looking for. Below, you'll find some instructions on how to properly format these answers. Reading this section is strongly recommended.

Homework Questions 1, 2 and 5
Formatting matters with the answers in these questions. For this reason, **understand that your answer can be technically correct but graded as wrong because you didn't follow the directions provided below.** Given that formatting is considered part of your answer, a wrongly formatted answer is still a wrong answer.

Please note the following comments below.

(a) ***On Question #1b, 1c, 2a, 2c, 5a and 5b****, please express your answer in terms of dollars,* ***not*** *dollars and cents. E.g., if you calculate 30.001 for your answer to one of these four questions, then you should express that answer as $30 and not $30.00.*

(b) ***On Question #1b, 1c, 2a, 2c, 5a and 5b****, please express any negative answer with the negative sign in front of the dollar sign and do not put a space between the negative sign and dollar sign. E.g., if you calculate -30 for your answer to one of these four questions, then you would express that answer as -$30 and not - $30.*

(c) ***On Questions #1a and 2b****, please round your answer (if necessary) to the nearest whole unit (integer). E.g., if you calculate 24.22 for your answer to one of these two questions, then you would express your answer as 24.*

Homework #4 Questions

1. Assume that a firm operates as a profit maximizing monopolist that produces and sells widgets, and that this firm has the following Demand and Marginal Revenue curves below.

P = 300 - 2Q   (Demand)
MR = 300 - 4Q   (Marginal Revenue)

where P = Price, Q = Quantity

a. Let's assume further that this price setting monoply firm sells all of its widgets at the same price. Although you don't have the MC and AC curves, what would be the maximum possible output that this firm would ever consider producing and selling when setting one price for each unit sold (linear) pricing strategy: _____

For each part below (b and c), assume that:

MC = 20   (Marginal Cost)
AC = 20   (Average Cost)

b. If the firm sells widgets all for the same price, then (given the curves mentioned here) the greatest possible profit that the firm can earn in this market would be equal to _____

c. Now, suppose this firm decides to set 2 different prices. Knowing that customers who buy widgets on weekdays are willing to pay a higher price for widgets (Group 1) than customers who buy their widgets on the weekend (Group 2), the firm sets the following prices:

- the weekday price for consumers in Group 1 is $120
- the weekend price for consumers in Group 2 is $100

Assume that consumers fit into one or the other of these two groups, based on their willingness to pay for widgets. Assume further that the firm can successfully engage in a pricing strategy of price discrimination. If the firm pursues this pricing strategy, answer the following:

i. The profit earned from Group 1 (the group facing the $120 price) is equal to _____

ii. The profit earned from Group 2 (the group facing the $100 price) is equal to _____

iii. The combined profit from both groups is equal to _____

2. Assume that firm X has a monopoly on the sale of beard trimming equipment for students who prefer to adopt the look of their (most or least) favorite Econ 201 economics professor. The equations below provide demand and cost-related information associated with selling this good:

$$P = 200 - 5Q \qquad \text{(Demand)}$$
$$MR = 200 - 10Q \qquad \text{(Marginal Revenue)}$$
$$MC = 50 \qquad \text{(Marginal Cost)}$$
$$AC = 50 + (150/Q) \qquad \text{(Average Cost)}$$

a. Let's assume this firm sells every unit at the same price. Under this pricing strategy, the greatest possible profits the firm can earn are equal to _____

Suppose the government believes that more people should be allowed to purchase beard trimming equipment at "cost" and, as a result, the government sets this firm's price equal to their marginal cost (i.e. P = $50).

b. Under this $50 price control, the firm will sell _____ units.

c. Under this $50 price control, the firm's profit is equal to _____

3. Consider the widget-selling firm from question #1 and Firm X from question 2. Given what you know about these firms, which of the following is a true statement:
   (a) the widget-selling firm and Firm X are both natural monopolies
   (b) the widget-selling firm is a natural monopoly, but not Firm X
   (c) Firm X is a natural monopoly, but not the widget-selling firm
   (d) neither Firm X nor the widget-selling firm is a natural monopoly.

4. A monopolist has the following Demand and Marginal Revenue equations:

$$P = 500 - 4Q \qquad \text{(Demand)}$$
$$MR = 500 - 8Q \qquad \text{(Marginal Revenue)}$$

Assume that this monopoly is a profit maximizing firm who is only willing to sell each unit at the same price. Once the firm decides on an output level, the firm must set a price. Given the demand and marginal revenue equations above, what is the lowest price this firm will ever set:

   (a) P = $500
   (b) P = $450
   (c) P = $400
   (d) P = $350
   (e) P = $300
   (f) P = $250
   (g) P = $200
   (h) none of the above

5. Assume that the monopolist from Question #4 has constant marginal and average cost of $50. I.e., the monopolist faces the following equations below.

$P = 500 - 4Q$ (Demand)

$MR = 500 - 8Q$ (Marginal Revenue)

$AC = 50$ (Average Cost)

$MC = 50$ (Marginal Cost)

a. Under the one price for every unit sold pricing strategy, the firm's greatest possible profit would be _____

b. Assume that this firm is considering the use of a two-part tariff. If the total profit from the two part tariff is greater than what occurs in part a, then the monopolist will switch pricing strategies.

Assume that in implementing the two part tariff, the firm sets $P = \$50$, and knows that they can collect all of what would be the maximum potential fixed fee revenue available at that price.

Under the two part tariff, the firm's overall profit would be _____

(For 5a and 5b, record your answer in terms of whole dollars, e.g. $100, not $100.00)

6. The question below can be answered after reading the article "Should the US eliminate entry barriers to the practice of law?". This article can be located within the Homework #4 material folder in Course Documents at Blackboard. Read the article and then answer the following question below.

Select each statement below that represents a statement made by the article (i.e. select every statement that is a point made within the article about eliminating entry barriers – this may involve selecting every statement, just one statement, two statements, etc.):

a. State licensing requirements and American Bar Association (ABA) regulations serve as entry barriers which limit the supply of lawyers

b. Entry deregulation in network industries spurred innovations in market, operations, and technology that improved firms' efficiency, service quality, etc.

c. Benefits from entry deregulation in certain industries extend beyond the industries that were deregulated

d. There are valid reasons to expect that entry deregulation would eliminate the inefficiencies in firms' operations

e. Entry deregulation should be expected to increase most lawyers' earnings premiums

Assume that you have a professor and student playing a game we'll call "the Final Exam game". Assume further that the game is played over just one period (e.g. final 4 weeks of the semester) and that this is a game with complete information.

Our student must decide between two different strategies. The first strategy involves paying attention, taking good notes and studying hard for the upcoming exam. There's obviously a higher cost with this strategy, but the student is well prepared for even a difficult final exam and gets more deferred gratification. We'll call that strategy **work hard**. The second strategy is to not pay attention and play on their phone during class (e.g. texting friends, posting selfies on Chat n Snap – or whatever it's called, etc.). This strategy has a lower time and effort cost, and although this strategy obviously opens the student up to imminent disaster if the final exam is difficult, it also provides more immediate fun. We'll call this second strategy **goof off**.

As the end of the period draws near, the professor must also choose between two strategies. The first strategy is to write a **hard exam**. We can assume that writing a harder exam takes significant effort, because the professor must spend a lot of time coming up with difficult questions. The professor also gets a lot of benefit from writing a hard exam, however, because a harder exam gives the professor more street cred (i.e. as a professor who takes learning seriously) amongst future students. The second strategy involves writing an **easy exam**, which takes almost no effort at all and provides a small amount of benefit to the professor.

Given the strategies outlined above, we have four possible outcomes.

Outcome 1: professor chooses <u>easy exam</u> and student chooses <u>work hard</u>, giving the professor 5 units of net benefit and the student 4 units of net benefit

Outcome 2: professor chooses <u>easy exam</u> and student chooses <u>goof off</u>, giving the professor 3 units of net benefit and the student 5 units of net benefit

Outcome 3: professor chooses <u>hard exam</u> and student chooses <u>work hard</u>, giving the professor 4 units of net benefit and the student 3 units of net benefit
Outcome 4: professor chooses <u>hard exam</u> and student chooses <u>goof off</u>, giving the professor 2 units of net benefit and the student 2 units of net benefit

7. What will be the outcome if this is played as a **simultaneous game**?
    (a) Professor will choose **easy exam**, and student will choose **work hard** (Outcome #1)
    (b) Professor will choose **easy exam**, and student will choose **goof off** (Outcome #2)
    (c) Professor will choose **hard exam**, and student will choose **work hard** (Outcome #3)
    (d) Professor will choose **hard exam**, and student will choose **goof off** (Outcome #4)

8. This question utilizes the information from above. The difference here is that we will assume the game is played as a one period sequential game (rather than as a simultaneous game). We will continue to assume that there is complete information and that the players will make choices which maximize their own net satisfaction.

What is the outcome if this game is played as a **sequential game with the Student moving first**?
    (a) Professor will choose *easy exam*, and student will choose *work hard* (Outcome #1)
    (b) Professor will choose *easy exam*, and student will choose *goof off* (Outcome #2)
    (c) Professor will choose *hard exam*, and student will choose *work hard* (Outcome #3)
    (d) Professor will choose *hard exam*, and student will choose *goof off* (Outcome #4)

9. Utilizing the information from above, what is the outcome if this is played as a **sequential game with the Professor moving first**?
    (a) Professor will choose *easy exam*, and student will choose *work hard* (Outcome #1)
    (b) Professor will choose *easy exam*, and student will choose *goof off* (Outcome #2)
    (c) Professor will choose *hard exam*, and student will choose *work hard* (Outcome #3)
    (d) Professor will choose *hard exam*, and student will choose *goof off* (Outcome #4)

Note that there are diagrams on the final page that you can use to answer questions 7-9.

As an aid, the figures which go with Questions #7-9 are also provided on the next page.
Note that you can use the figures below to answer each question.

Student

7)

	Work hard	Goof off
Easy exam	NB_P, NB_S 5, 4	NB_P, NB_S 3, 5
Hard exam	NB_P, NB_S 4, 3	NB_P, NB_S 2, 2

Professor (row label between Easy exam and Hard exam)

8)

		NB_S	NB_P
Professor Hard Exam		2	2
Goof off — Easy Exam		5	3
Student — Hard Exam		3	4
Work hard — Easy Exam		4	5

9)

		NB_P	NB_S
Student Goof off		2	2
Hard Exam — Work Hard		4	3
Professor — Goof off		3	5
Easy Exam — Work Hard		5	4