Fall 2023
ECO2011 L07-10
Basic Microeconomics
Dec. 08, 2023
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Written assignment #05

Instructions:

0) This assignment work has only Pass / Fail grades. If you submit your work (with reasonable work effort) before the due time, you obtain the full mark and /or a pass grade. Otherwise, you obtain zero mark and /or a fail grade. The teaching assistants will not grade this assignment work, or discuss the questions and answers of this assignment in tutorials. Instead of grading this assignment work, the teaching assistant(s) will upload some hints on solving the problems onto BB after the submission deadline.

1) Submit by 15:00, Friday, December 15, 2023 to the assignment drop box located on the 3rd floor of Zhiren building.

2) Late submission is not allowed. If there is reason that a late homework is accepted, at least 50 marks (out of 100) per day will be deducted.

3) Your answers must be in English.

4) Your answers must be in hand writing. Photocopy, computer printout or electronic submission will not be accepted.

5) Write down your name and student ID on the top of the front page of the answer sheets. Submission without a name or student ID will receive zero mark.

6) Once you have submitted your assignment work to the drop box, you cannot take it back or change any part of the answers.

7) If you submit more than one copy of the assignment work, the teaching assistants /or graders will randomly choose a copy to grade, and /or give you the lowest score among all your assignment work submissions.

8) Write on both sides of papers.

9) There is no need to copy the questions.

10) Use a pen /or a ball pen.

11) Staple your answer sheets if there is more than one sheet. If you do not staple your answer sheets, only the sheet that shows your name and student ID will be graded.

12) If you think there is chance of getting stuck, blocked, or locked down in your home town and cannot come back campus to submit your homework, work out your assignment work early and mail it to the teaching assistants' office (3rd floor, Zhiren building) by express delivery and make sure it arrives before the deadline.

13) If you have any question related to the submission of this written assignment, ask in Forum#2 on BB.

14) Read the University policy regarding academic honesty before doing this assignment.

Question #01

The following table shows the demand curve facing a monopolist who produces at a constant marginal cost of $10:

Price	Quantity
$18	0
16	4
14	8
12	12
10	16
8	20
6	24
4	28
2	32
0	36
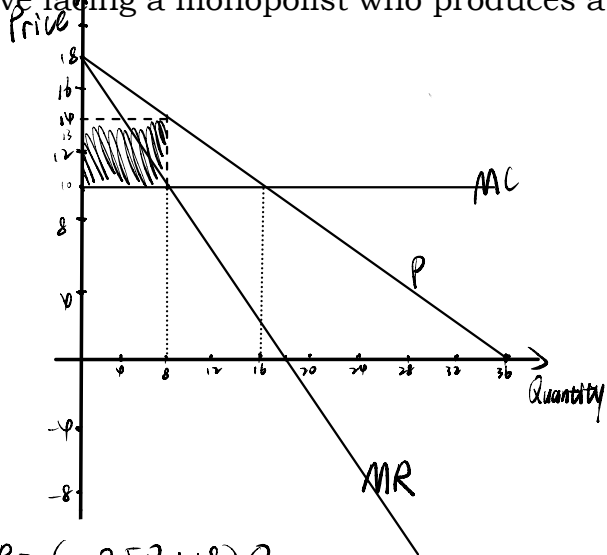
(a) $TR = (-0.5Q + 18)Q$
$MR : P = TR' = -Q + 18$

a) Calculate the firm's marginal revenue curve.

b) What are the firm's profit-maximizing output and price? What is the firm's maximum profit? $32

$P = MC = 10 $Q = 16$ 8 $14

c) What would be the price and quantity in the competitive outcome?

d) What would the social gain be if this monopolist were forced to produce and price at the competitive outcome? Who would gain and who would lose as a result?

$\frac{1}{2} \times (16 - 8) \times (10 + 14) = 96$ ($)   consumers   producer (monopolist)

Question 2

Four roommates are planning to spend the weekend in their dorm room watching old movies, and they are debating how many to watch. Here is their willingness to pay for each film:

	John	Peter	David	Tom
First film	$7	$5	$3	$2
Second film	6	4	2	1
Third film	5	3	1	0
Fourth film	4	2	0	0
Fifth film	3	1	0	0

a) Within the dorm room, is the showing of a movie a public good? Why or why not?

b) If it costs $10 to rent a movie, how many movies should the roommates rent to maximize total surplus?

c) If they choose the optimal number from part (b) and then split the cost of renting the movies equally, how much surplus does each person obtains from watching the movies?

d) Is there any way to split the cost to ensure that everybody benefits? What practical problem does this solution raise?

Q2

(a) Once a movie is played in the dorm room, it's difficult to exclude any of the roommates from watching it.
One roommate watching the movie doesn't prevent the others from watching it too.
So, the showing of a movie in the dorm room can be considered a public good, as it's non-excludable and non-rivalrous within the context of the roommates.

(b) Total surplus is the total benefit to the group minus the total cost.
We need to calculate the total willingness to pay (WTP) for each movie and compare it with the cost to see where the surplus is maximized.
Let's calculate the total WTP for each movie and compare it with the cost:
First movie: John ($7) + Peter ($5) + David ($3) + Tom ($2) = $17
Second movie: John ($6) + Peter ($4) + David ($2) + Tom ($1) = $13
Third movie: John ($5) + Peter ($3) + David ($1) + Tom ($0) = $9
Fourth movie: John ($4) + Peter ($2) + David ($0) + Tom ($0) = $6
Fifth movie: John ($3) + Peter ($1) + David ($0) + Tom ($0) = $4
The cost to rent each movie is $10. So, we should compare the total WTP with the cost for each movie:
First movie: Surplus = $17 - $10 = $7
Second movie: Surplus = $13 - $10 = $3
Third movie: Surplus = $9 - $10 = -$1 (negative surplus, not beneficial)
Fourth movie and beyond: Surplus is negative.
So, to maximize total surplus, they should rent two movies.

(c) The total cost for two movies is $20. Split four ways, each person pays $5.
We need to calculate each person's surplus for the two movies:
John's surplus: WTP for 2 movies ($7 + $6) - Cost ($5) = $8
Peter's surplus: WTP for 2 movies ($5 + $4) - Cost ($5) = $4
David's surplus: WTP for 2 movies ($3 + $2) - Cost ($5) = $0
Tom's surplus: WTP for 2 movies ($2 + $1) - Cost ($5) = -$2

(d) Ideally, each person should pay according to their WTP to ensure everyone benefits.

Q4

(a) Negative externality. In this case, the theater's activities (holding events that attract audiences) create additional traffic, which imposes costs (like congestion, pollution, noise) on the community that is not reflected in the price of theater tickets. The theater and its patrons don't bear these costs, but the community does.

(b)
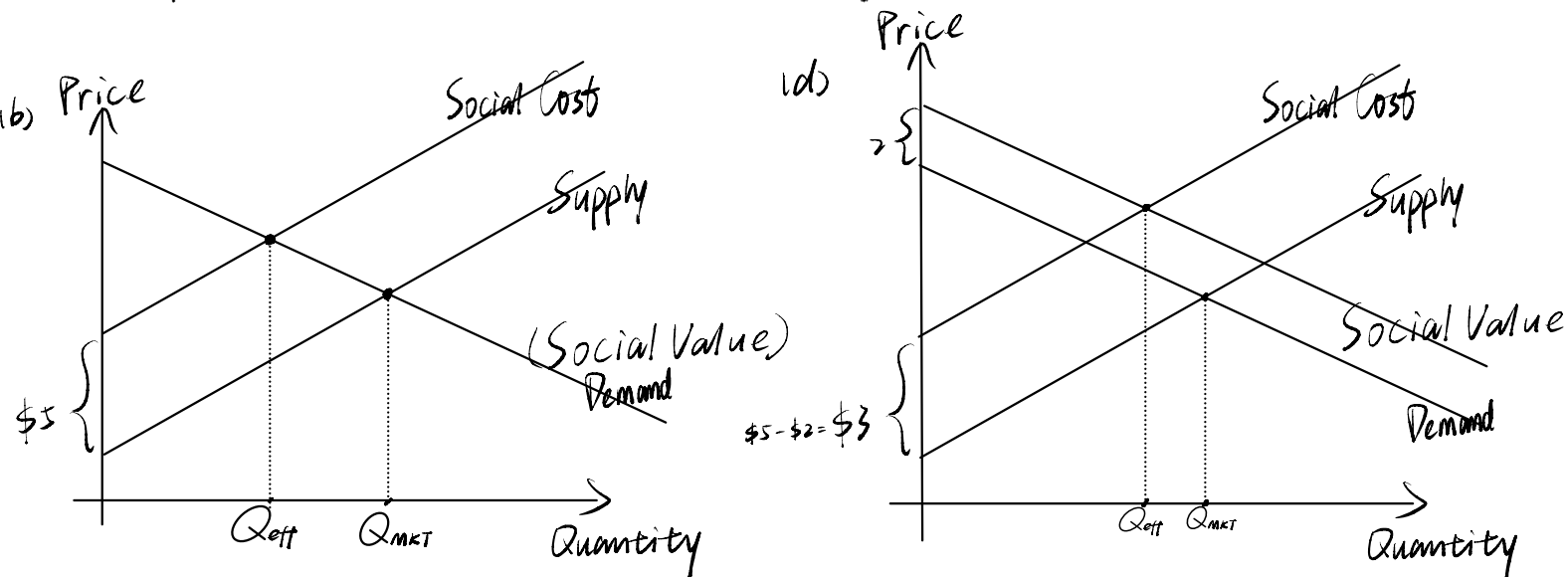
The per-unit amount of the externality is $5, shown as the vertical distance between the supply curve and the social cost curve.

(d)

The per-unit amount of the net externality is $3, reflecting the combined effect of both the positive and negative externalities.

(c) positive externality. A positive externality occurs when a product or service's production or consumption confers a benefit on third parties. In this case, the theater's activity (having rehearsals that result in actors, stagehands, and others being around) makes the streets safer, which is a benefit to the community not captured in the price of the tickets.

(e) A government policy to achieve an efficient outcome could include:
Imposing a tax of $3 per ticket on the theater. This tax equals the net externality per ticket and would shift the theater's supply curve upwards to align with the social cost curve, leading to a price and quantity of tickets that reflect the true social cost and benefit.
Alternatively, the government could provide a subsidy of $2 per ticket for the positive externality and impose a $5 tax for the negative externality. This would also align the private costs and benefits with the social costs and benefits, leading to an efficient outcome.

Question 3

Suppose a profit-maximizing monopolist is producing 800 units of output and is charging a price of $40 per unit.

a) If the elasticity of demand for the product is -2, find the marginal cost of the last unit produced. $MC = P(1 + \frac{1}{\varepsilon_d}) = 40(1 + \frac{1}{-2}) = 20 \ (\$)$

b) What is the firm's percentage markup of price over marginal cost? $\frac{\$40 - \$20}{\$20} \times 100\% = 100\%$

c) Suppose that the average total cost of the last unit produced is $15 and the firm's fixed cost is $2000. Find the firm's profit.

$$\pi = TR - TC = 40 \times 800 - (15 \times 800 + 2000) = \$ 18000$$

Question 4

A local drama company proposes a new neighborhood theater in San Francisco. Before approving the building permit, the city planner completes a study of the theater's impact on the surrounding community.

a) One finding of the study is that theaters attract traffic, which adversely affects the community. The city planner estimates that the cost to the community from the extra traffic is $5 per ticket. What kind of an externality is this? Why?

b) Graph the market for theater tickets, labeling the demand curve, the social-value curve, the supply curve, the social cost curve, the market equilibrium level of output, and the efficient level of output. Also show the per-unit amount of the externality.

c) Upon further review, the city planner uncovers a second externality. Rehearsals for the plays tend to run until late at night, with actors, stagehands, and other theater members coming and going at various hours. The planner has found that the increased foot traffic improves the safety of the surrounding streets, an estimated benefit to the community of $2 per ticket. What kind of externality is this? Why?

d) On a new graph, illustrate the market for theater tickets in the case of these two externalities. Again, label the demand curve, the social-value curve, the supply curve, the social cost curve, the market equilibrium level of output, and the efficient level of output, and the per-unit amount of both externalities.

e) Describe a government policy that would result in an efficient outcome.

***** End of assignment *****