

ECON 360: Intermediate Microeconomics

Final Exam, Summer 2024

- Define any variables you need to answer the problems.
- All materials except for your cheat sheet should be put away before beginning the exam. Use of cell phones during the exam for any purpose is forbidden.
- Please write your answers in the space provided.
- Keep your answers short but clear. Your goal is to convince a skeptical grader that you understand the relevant concepts well enough to answer the question you are given.
- The questions on the exam sum to 54 points.
- Remember to turn in your cheat sheet with your exam.
- Good luck on your Econ test!

1. (4 points) What is your name?

1 True/False Questions

Indicate “T”rue or “F”alse for each of the following statements or claims. For each false statement, if you correctly and clearly explain why it is false, I will give you a bonus point. No explanations necessary for claims or statements which you think are true.

2. (2 points) Mark and Megan own an ice cream shop in Endicott, and they only sell ice cream cones. Based on market demand and supply, the price Mark and Megan can charge for ice cream cones varies by season. In winter and spring, the market price for ice cream cones is \$3. In the fall and summer, the market price for ice cream cones is \$6. Taking into account all costs, the average cost for Mark and Megan to produce one ice cream cone is \$4 in all seasons. **Claim:** Based on economic theory from class, Mark and Megan should exit the Endicott ice cream market.

3. (2 points) Suppose you own a diner, and your only two inputs are workers (L) and grills (K). You currently have 6 workers and 7 grills. If you were to hire another worker, while holding the number of grills constant, that worker would generate \$50 in additional revenue. If you were to add another grill to your diner, while holding the number of workers constant, that grill would also generate \$50 in additional revenue. An extra grill costs \$50, and hiring an extra workers costs \$45. **Claim:** Based on what we have learned in class, your decision to hire 6 workers and rent 7 grills is not consistent with profit maximizing behavior.

4. (2 points) Bill loves dogs, and he gets extra utility out of being able to say hi to any dog he encounters. His neighbor Dave is perfectly indifferent to owning a dog versus not owning a dog. Dave does not currently own a dog. **Claim:** Based on what we have learned in class, this is a socially efficient outcome, because in a socially efficient outcome Dave should only consider his own preferences when making his decisions.
5. (2 points) You and your friend are playing rock paper scissors for the last cookie in the cookie jar. (You are playing the traditional version of rock paper scissors, in which both of you reveal your choice of rock, paper or scissors at the same time. Rock beats scissors, scissors beats paper, and paper beats rock.) **Claim:** Based on what we have learned in class, there is no pure strategy Nash Equilibrium to this game.

6. (2 points) Suppose the market for 4-door sedans is characterized as a monopolistic competition market. You observe that in the short run 4-door sedan manufacturers are making positive economic profit. **Claim:** Based on what we have learned in class, 4-door sedan manufacturers will continue to make positive economic profits in the long run.

2 Multiple Choice Questions

Circle the best answer to each question. There is only one answer for each question. No explanation necessary.

7. (2 points) You determine your production function is Cobb-Douglas and exhibits increasing returns to scale. Based on what we have seen in class, which input bundle could NOT be on the same isoquant as the bundle (4,8).
- A. (3,10)
 - B. (5,6)
 - C. (5,9)
 - D. (2,14)
8. (2 points) Suzie's production function is $y = K^2L$. What is her marginal product of capital when $K=3$ and $L=4$?
- A. 12
 - B. 24
 - C. 48
 - D. 36
9. (2 points) When Bill produces 8 phones, his marginal cost is below his average variable cost. Bill realizes that his profit maximizing quantity is 12 phones. Based on class, what must be true about Bill's average variable cost at 8 phones?
- A. Bill's AVC is decreasing.
 - B. Bill's AVC is increasing.
 - C. Bill's AVC is constant.
 - D. Bill's AVC is equal to his MC.
10. (2 points) McDonald's can make coffee one of two ways. They can either have a worker (L) make coffee, or they can use an automatic coffee machine (K). Adding an extra coffee machine always produces 4 times as much additional output as adding an extra worker, holding the other input constant. Which production function could represent the production function for McDonald's coffee?
- A. $y = K + 4L$
 - B. $y = K + L$
 - C. $y = 4K + L$
 - D. $y = 4KL$

11. (2 points) Standard Oil is a famous example of a monopoly. Suppose Standard Oil maintained its monopoly by making it extremely difficult for other firms to enter the market. Based on what we have learned in class, making it difficult for other firms to enter is which characteristic of a monopoly market?
- A. Barriers to entry.
 - B. Differentiated product.
 - C. Downward sloping marginal revenue curve.
 - D. Restricted quantity compared to perfect competition.

3 Short Answer Questions

These questions all require an explanation. Remember you are trying to convince me you understand the why and the how of what you are doing, not simply getting the answer correct. Cite specific concepts from class in your answers for full credit.

12. Bill makes headphones in a perfectly competitive market. His total cost function is given by the function $c(q) = 100 + 2q + \frac{1}{2}q^2$. His total revenue is given by the function $TR = 4q$.

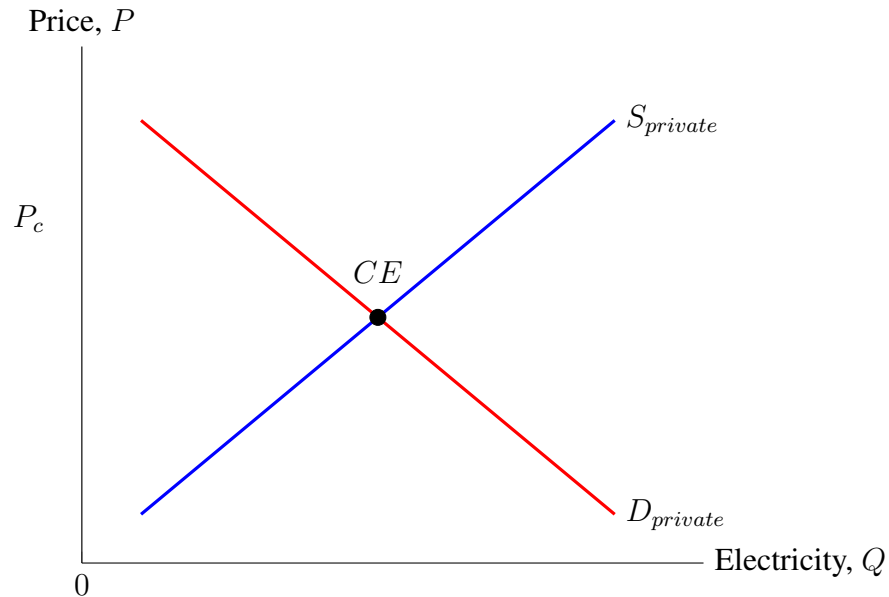
(a) (4 points) Find Bill's profit maximizing quantity and the market price. Show your work.

(b) (4 points) Based on what we have learned in class, will Bill operate or shutdown in the short run? Explain your answer and show all work.

- (c) (2 points) Based on what we have learned in class, will Bill remain in the market or exit the market in the long run? Explain your answer and show all work.

13. Suppose the graph below shows the market for electricity, with the competitive equilibrium denoted by the point CE . In this market, the suppliers burn coal in order to make electricity. This coal burning produces pollution which is a negative externality.

- (a) (2 points) On the graph, draw a new demand or supply curve to indicate the negative externality, and indicate the socially efficient point on the graph based on what we have seen in class.



- (b) (4 points) Using the concepts of external benefits and costs from class, explain why the socially efficient point you found in part a) makes sense compared to the competitive equilibrium point.

14. (4 points) Bill and Dave are on the soccer field and Bill decides to take a penalty kick with Dave as the goalie. Bill has two options on where he can kick the ball and score: i) low or ii) high. Dave has the same two options on where to dive, i) low or ii) high. Dave and Bill pick at the same time. If Bill and Dave pick the same option, Dave saves the goal and wins. If Bill and Dave pick different options, Bill scores the goal and wins. Both Bill and Dave prefer winning to not winning. Using the concepts of best replies/responses, explain why there is no pure strategy Nash Equilibrium to penalty kick taking as defined in this question.

15. Erin's coffee shop has been growing since the midterm exam, and is now the monopoly coffee shop in Binghamton. The demand for coffee in Binghamton is given by $P = 20 - 2Q$. Erin's total costs are given by the equation $TC = 20 + \frac{1}{2}Q^2$.
- (a) (2 points) Derive Erin's marginal cost and marginal revenue functions based on what we have done in class.

- (b) (4 points) On the graph below, draw i) Erin's marginal cost curve ii) Erin's marginal revenue curve, and iii) the demand for Erin's coffee. Indicate Erin's profit maximizing quantity and the profit maximizing price on your graph. No explanation necessary.



- (c) (4 points) On your graph, include the equilibrium price and quantity if the coffee market in Binghamton was a perfectly competitive market. Using concepts from class, explain why the perfectly competitive equilibrium differs from the profit maximizing point you found in part b.