

ECON 100 - Introduction to Economics

Homework 6

- Define any variables you need to answer the problems.
 - You may use any material from this course (including other students). You may use Gen AI to help check your work or understanding, but you should not copy-paste solutions or answers obtained from Chat GPT/AI.
 - Define any variables you need to answer the problems.
 - Keep your short-answer explanations 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 this homework sum to 90. But you get a 100 for attempting the majority of the questions!
 - Please be sure to write down the name(s) of anyone else you worked with on this homework (either at the top or under your name). Place a star next to your name OR underline OR some way to make it easy for me to tell which homework is whose.
 - Bring any and all questions to office/student hours!
-

1. (2 points) What is your name?
2. (2 points) What section are you in? (Either section number or what time your class meets)

1 True/False Questions

Indicate “T” rue or “F” alse for each of the following statements or claims. If you correctly explain why a statement or claim is false, I will give you a bonus point up to a 100% on this homework.

3. (2 points) A monopolist’s marginal revenue curve is always below the market demand curve for any quantity.
4. (2 points) Publix is a supermarket popular in my home state in Florida. Publix is famous for BOGO (buy-one get-one free). **Claim:** If Publix is a monopolist, this BOGO program is a form of first-degree price discrimination.
5. (2 points) **Claim:** Compared to a perfectly competitive market, a monopoly market will always result in lower consumer surplus, higher producer surplus, and deadweight loss.
6. (2 points) **Claim:** A monopoly can always increase its profit by charging different prices for different demographic groups within the same market.
7. (2 points) If a monopolist can price discriminate, the monopolist will sell fewer units at a higher price to the portion of the market which is relatively less responsive to changes in price.

2 Multiple Choice Questions

Choose the best answer for each question. There is ONLY one correct answer for each question. No explanation necessary.

8. (2 points) Which of the following represents a firm engaging in second-degree price discrimination.
- A. An airline using an algorithm to set a unique price for each individual based on their predicted willingness to pay.
 - B. Taco Bell offering a discount to Hamilton students.
 - C. The State Fair charging an entry fee and fee for each ride.
 - D. None of the above.
9. (2 points) In the market for bottled water, suppose there are four producers who all produce identical bottle water in taste and quality, even though there are no barriers to entry. All four producers have identical costs of production. The price charged for bottle water is above marginal cost. **Question:** Which assumption of a perfectly competitive market is violated?
- A. Commodity product.
 - B. Barriers to entry.
 - C. Many small firms.
 - D. This market does not violate any assumptions and is perfectly competitive.
10. (2 points) A monopolist's demand curve is given by $Q^D = 4 - 0.5P$. Which represents the monopolist's marginal revenue curve?
- A. $MR = 4 - P$.
 - B. $MR = 8 - Q$.
 - C. $MR = 4 - Q$.
 - D. $MR = 4 - 2Q$.
11. (2 points) Suppose a firm's cost's are such that $AVC = 10 + q$ and $AFC = \frac{100}{q}$. Which of the following is the firm's total cost function?
- A. $10 + q + \frac{100}{q}$.
 - B. $10q + q^2 + \frac{100}{q}$.
 - C. $110 + q$.
 - D. $100 + 10q + 10q^2$.
12. (2 points) Consider 2 markets. In Market A, there are 200 coffee shops selling coffee, but each coffee shop has a distinct brand, ambiance, and specialty drinks the other shops do not have. In Market B, there are 3 different gas stations selling chemically identical gasoline. **Question:** In which market is total surplus maximized?
- A. Market A.
 - B. Market B.
 - C. Both.
 - D. Neither.

3 Short Answer Questions

These questions all require math, diagrams, and/or written explanations. Remember you are trying to convince me you understand the why and how of what you are doing, not simply that you are able to get the numerical/graphical answer correct. Include specific concepts from class in your written explanations for full credit.

13. **All You Can Eat.** Suppose the only restaurant in Clinton serves plates of food, and a typical diner's marginal benefit for each additional plate is below. The restaurant's marginal cost to prepare each plate is \$3, and assume it has no other costs.

Plate	Marginal benefit
1st	\$14
2nd	\$12
3rd	\$10
4th	\$8
5th	\$6
6th	\$4
7th	\$2
8th	\$0

- (a) (6 points) Suppose the restaurant sells plates individually for \$5 each. How many plates does a diner buy, and what is the diner's consumer surplus? Show all calculations. No explanation necessary.
- (b) (6 points) The restaurant switches to an all-you-can-eat buffet: diners pay a single entry fee and then eat as many plates as they like at no additional charge. How many plates does a diner eat, and what is the diner's total benefit from the meal? Show all calculations. Assume that a diner only eats a plate if it makes them strictly better off (i.e., if a diner is indifferent, the diner does not eat the plate).
- (c) (6 points) What is the range of entry fees for which the buffet earns a positive profit per diner and diners are still willing to come? What is the maximum profit per diner? Show all calculations.
- (d) (6 points) Suppose the restaurant instead went back to charging \$9 per plate. How many plates would a diner buy, and what is the restaurant's profit per diner? Is this more or less profitable than the buffet at its maximum entry fee?
- (e) (6 points) A friend says, "An all-you-can-eat buffet can't make money, because every extra plate is free to the diner but costs the restaurant \$3." Evaluate this claim using the concepts from class.
- (f) (6 points) Suppose the restaurant instead charges an entry fee plus \$3 per plate. What is the largest entry fee diners would pay, and how many plates does a diner eat? Is the restaurant's maximum profit per diner higher or lower than under the buffet? Explain why the two differ.

4 Ungraded Section

14. **Should AMC Offer a Discount to Hamilton Students?** Suppose AMC is the only movie theater in Clinton and acts as a monopolist. Each night, Hamilton students and other Clinton residents have different demand for tickets. Let P be the ticket price in dollars. Student demand is $Q_S = 120 - 10P$ and resident demand is $Q_R = 200 - 10P$, where Q is tickets per night. AMC's cost of showing the movie to one more person is \$4 per ticket, and it has no other costs. AMC can check student IDs, and tickets cannot be resold.
- (a) (8 points) Suppose AMC can charge students and residents different prices. Find the profit-maximizing price and quantity for each group, and AMC's total profit per night. Show all calculations. No explanation necessary.
 - (b) (8 points) Suppose instead AMC must charge everyone the same price, and assume this price is low enough that both groups buy tickets. Find AMC's profit-maximizing single price, the quantity sold, and its profit per night. Show all calculations. No explanation necessary.
 - (c) (4 points) Suppose AMC sets a single price high enough that students buy no tickets at all. What price would maximize profit in this case, and what is AMC's profit? Which single-price strategy, (b) or (c), is better for AMC?
 - (d) (4 points) Should AMC offer a discount to Hamilton students? Use your answers to the previous parts to explain.
 - (e) (6 points) Why does the discount go to students rather than to residents. Explain using concepts from class.