

NAME: _____

Cooleconomics.com

Intermediate Microeconomics

Exam 3

You have 2.5 hours to complete this 200-point closed-book, closed-notes exam. (You may use a 1-sided 8.5" x 11" study sheet.) Write clearly and coherently. You MUST show your calculations on problems that require them, in order to receive any credit for those problems. (DO NOT ROUND NUMERICAL ANSWERS TO THE NEAREST INTEGER.) Good luck!

1. (32 points) In the long run, widgets may be produced at constant marginal cost of \$5. Market demand for widgets is $Q = 200 - 3P$. Calculate:

a) equilibrium price, quantity, and profits if the widget market is *perfectly competitive*:

price _____ quantity _____ profits _____

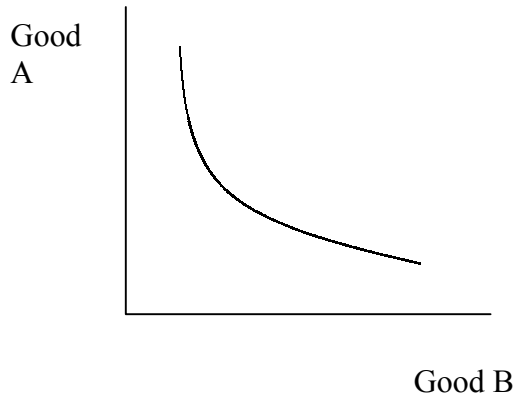
b) equilibrium price, quantity, and profits if the widget market is a *monopoly* (no price discrimination):

price _____ quantity _____ profits _____

c) Total value of widget sales of the perfectly competitive outcome and of the monopoly outcome:

perfect competition sales (\$) _____ monopoly sales (\$) _____

2. (20 points) Spielberg's indifference curves for good A and good B have a convex shape, like this:



Economist Ebert thinks that good A is “16 ounce bottles of Coke” and good B is “20 ounce bottles of Coke.” Economist Siskel thinks that good A is “pizza” and good B is “beer.”

a) Who is more likely to be correct—Siskel or Ebert? Clearly explain, *using the concept of marginal rate of substitution* in your explanation. (Answers without the use of the term *marginal rate of substitution* will receive no credit.)

b) Which of (i)-(iv) is most likely to describe Spielberg's demand for good A, assuming the convex indifference curve? *Clearly explain your choice.* (Unacceptable answer: none of these) (“I” is income in the below equation.)

(i) $Q_A = P_A + 100$ (ii) $Q_A = -100 - 5P_A$ (iii) $P_A = 10$ (iv) $Q_A = (.3I)/P_A$

3. (36 points) A firm has demand equation $Q = 3000 - 2P$ for its product and total cost equation $C = 60 + 3Q$.

a) Calculate profit-maximizing price, quantity, and profits, assuming NO price discrimination

price _____ quantity _____ profits _____

b) Calculate profit-maximizing lowest price charged, quantity, and average total cost, assuming first degree price discrimination

lowest price _____ quantity _____ average total cost _____

4. (32 points) Jenny's company produces biscuits at a constant cost of \$6 each. The company has 2 groups of buyers—rich with demand $Q_{\text{rich}} = 2000 - P$, and poor with demand $Q_{\text{poor}} = 2000 - 2P$.

a) Calculate profit-maximizing price, quantity, and profits, assuming that it is illegal/impossible to segregate the two groups of buyers.

price _____ quantity _____ profits _____

b) Calculate profit-maximizing price, quantity, and profits, assuming that it is legal/possible to segregate the two groups of buyers.

rich price _____ rich quantity _____

poor price _____ poor quantity _____

profits _____

5. (28 points) Complete (a)-(n) in the following table. (Show your work for partial credit; NO partial credit will be given to any answer without work shown for it specifically.)

Q	AFC	AVC	ATC	TFC	TVC	TC	MC
0				a)	b)	6	
1	c)	d)	e)	f)	g)	h)	12
2	i)	18	j)	k)	l)	m)	n)

Work:

a)

b)

c)

d)

e)

f)

g)

h)

i)

j)

k)

l)

m)

n)

6. (32 points) Identical duopolists each have constant marginal costs of \$2. They face the market demand curve: (Q is total units of market demand: $Q = Q_1 + Q_2$, P is price per unit)

$$Q = 40 - P$$

Calculate the price charged by each firm, and the quantity produced, under the following separate hypothetical market conditions:

a) The duopolists collude.

Q _____ P _____

b) There is a Cournot equilibrium

Q _____ P _____

c) There is a Stackelberg equilibrium

Q_1 _____ Q_2 _____ P _____

d) There is a Bertrand equilibrium

Q _____ P _____

7. (12 points) A firm can buy a robot for \$100 today which will result in extra revenues of \$35 at the end of each year (beginning one year from today) for 3 years. At the end of the 3 years the robot can be sold for scrap at \$5.

Is the purchase of the robot wise? Use some of the above information, a discount rate of 9%, and the Net Present Value criterion to support your analysis. (Your score depends almost entirely upon your analysis.)

Yes _____ No _____

8. (8 points) A firm has total cost equation: $\text{total cost} = 400 + 3Q^4$
Derive equations representing this firm's marginal cost and average variable cost.

marginal cost equation _____

average variable cost equation _____