

First Exam

Write all answers in your blue book and show all work there. Return your exam in your blue book.

25 pts

- 1) An effort to discourage consumption of fast food has taken the form of a tax. A one dollar excise tax has been placed on most fast food items, burgers, fries etc. Without the tax, demand for burgers is

$$Q_D = 10000 - 2500P$$

and supply is

$$Q_S = -100 + 100P$$

- Find the equilibrium price and quantity before the tax and draw a well-labeled diagram of the market.
- Find the equilibrium price and quantity after the tax and modify your diagram of the market to show this result.
- Identify the price to the buyer and seller (after the tax) in the diagram. Would these values be the same if the tax were a sales tax instead of an excise tax?

15 pts

- 2) Bart and Lisa both have homework to do, math and science. Lisa is better at both as shown by times shown in the table below.

Time required to do homework		
	Bart	Lisa
Math	60 min.	30 min.
Science	45 min.	15 min.

- Find the opportunity costs of each person for each task.
- Does Bart have a comparative advantage in either task? If so, which one?
- Aside from the fact that they should do their own homework for educational purposes, can mutually beneficial trade between Bart and Lisa be arranged? If so, describe such a trade.

30 pts

3) In year 1, the price of good X is \$2 and the price of good Y is \$3. George consumes 10 units of X and 15 units of Y.

- a) Draw a well-labeled diagram of George's budget line and utility maximum.
- b) What is George's income in year 1?

In year 2, the price of good X is \$2.5 and the price of good Y is \$4. George consumes 12 units of X and 11 units of Y.

- c) Add George's budget line and utility maximum for year 2 to your diagram.
- d) What is George's income in year 2?
- e) Use a Laspreye price index to determine if George is better or worse off in year 2. Does your result agree with the utility that you show in your diagram?

15 pts

4) Find the derivative with respect to x for each of the following functions.

- a) $U = 4x^{1/3}$
- b) $AC = 10 - x + .01x^2$
- c) $U = 3xy$, where $y = f(x)$

15 pts

5) a) Draw a well-labeled diagram of the function in 4a. Does this function exhibit diminishing returns? Why?

b) Draw a well-labeled diagram of the average cost function in 4b. Is MC more or less than AC where $x = 5$? Why?

I have neither given nor received unfair aid on this test nor am I aware of anyone else who has.
