

Review Questions for Mid-Term exam (Fall 06)

Questions from the back of the chapters I like:

Ch2. #1, 3, 4, 5

Ch3. #2, 3, 4

Ch4. #1, 2, 5

Ch5. #1, 2, 3, 4, 5

From old exams:

1. Each household consumes and can produce two goods, Manna and Ambrosia. Households can produce six loaves of Manna or one gallon of Ambrosia per hour. In a factory setting, a worker can produce three gallons of Ambrosia per hour.

- Workers can all live in condominiums atop the factory (they face zero travel time to work).
- Workers get paid six loaves of Manna per hour.
- Ambrosia is sold at a price of 2 Manna/gallon of Ambrosia.
- It takes 5 minutes to travel one round-trip mile (so, two miles away takes 10 minutes to make the round trip).

a. (10) Verbally and graphically describe the market area in terms of the cost of a household to acquire a gallon of Ambrosia at the factory.

b. (5) How will the size of the city be determined?

c. (5) How would a faster transportation option that allows workers to travel one round-trip mile in 2.5 minutes affect the market area and the size of the city?

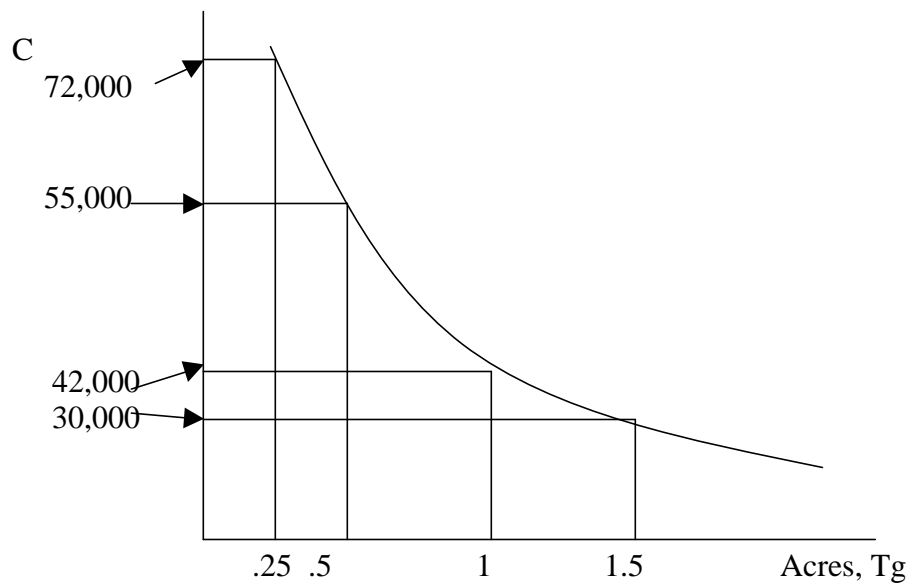
2. Assume Fort Worth Olympic Generators (FOG) produces generators for export to cities all over the US. Consumers pay for shipping from the Ft. Worth Rail Terminal (FRT) to their site, but FOG has to pay for the cost of transporting the units to FRT. The cost of transporting each generator to FRT is \$100 per unit for each mile the factory is from FRT. The company rents land for use in production and uses \$42,000 of non-land inputs in production. Right now, they produce 50 generators per month and each one sells for \$2000 each.

a. (5) Explain the concept of “bid-rent.”

b. (5) Given that their current factory is 6 miles from the FRT and they are using 1 acre of land, what is the current bid rent for the land.

c. (5) What would their bid-rent be if they moved the factory 1 mile closer, assuming they were required to still use 1 acre of land?

The following is their production isoquant (that is, it shows all the combinations of land, T_g , and C needed to produce 50 generators per month).



d. (5) Assuming they could substitute non-land inputs for land as noted in the above graph, what would their bid-rent be at 5 miles assuming they could choose to use a different input mix (land and C) according to their production isoquant? Explain or show the process by which you arrived at your answer.

2.

a. (10) Assume a city where all households have similar preferences and all locations are similar except for commuting cost). The Smith family lives 4 miles from the city center where Ms. Smith works (Mr. Smith telecommutes from home). The family currently has an income of \$5000 per month and rents a 2000 sqft home at a price of \$1.50 per sqft. Ms. Smith’s commuting cost is \$80 per mile per month. Using the consumer choice model (indifference curves etc.), depict the Smith’s utility maximizing decision to rent the house they rent.

b. (10) Assuming they (and all other households) are indifferent between living 3 or 4 miles from the city center, demonstrate on the graph from part **a** above how the new price per sqft for housing will be determined (assuming all households have the same preferences). Verbally describe and graphically indicate the Smith's new consumption of housing and All Other Goods (AOG) and how this sets the price for housing.

3. (20) A few years ago, the city of Dallas decided to undertake the Trinity River Project, TRP, that would, among other things, greatly enhance the physical beauty of the city and Dallas with a large recreation area. The project will largely be paid for by the state of Texas and the Federal government (so assume local property taxes will not rise as a result). (Here is some information that might make it easier to express your answer: Assume each business in Dallas uses 1 acre and employs 10 workers while each household has one worker and uses .5 acres of land. Also, assume that before the project gets underway, businesses take up 100 acres of land.)

Using the model that allows for the interaction of land-use and labor markets, verbally and graphically explain the effect of the TRP on land-use, wages, employment, the size of the city, and the amount of land used for business relative to housing. You may well want to make up some numbers consistent with the situation to help explain the situation.

4. Each household can produce three sausages or two shirts per hour. In a factory, a worker can produce six shirts per hour.

- Workers can all live in condominiums atop the factory (they face zero travel time to work).
- Workers get paid three sausages per hour.
- Shirts are sold for a price equal to the labor cost of production (in this case, $\frac{1}{2}$ a sausage each).
- It takes 10 minutes to travel one round-trip mile. A household member can only trade for one shirt per trip.

a. (10) Verbally and graphically describe the market area in terms of the cost of a household to acquire a shirt at the factory.

b. (5) Explain how the size of the city be determined?

c. (5) What is the essential part of this problem that allows a city to develop?