

## Problem Set One

Name \_\_\_\_\_

### Chapter 1

3. Residents of your city are charged a fixed weekly fee of \$6 for garbage collection. They are allowed to put out as many cans as they wish. The average household disposes of three cans of garbage per week under this plan. Now suppose that your city changes to a “tag” system. Each can of refuse to be collected must have a tag affixed to it. The tags cost \$2 each and are not reusable. What effect do you think the introduction of the tag system will have on the total quantity of garbage collected in your city? Explain briefly.

6. Suppose that in the last few seconds you devoted to question 1 on your physics exam, you earned 4 extra points, while in the last few seconds you devoted to question 2 you earned 10 extra points. You earned a total of 48 and 12 points, respectively, on the two questions, and the total time you spent on each was the same. If you could take the exam again, how – if at all – should you reallocate your time between the questions?

9. For each long-distance call anywhere in the continental United States, a new phone service will charge users 30 cents per minute for the first 2 minutes and 2 cents per minute for additional minutes in each call. Tom’s current phone service charges 10 cents per minute for all calls, and his calls are never shorter than 7 minutes. If Tom’s dorm switches to the new phone service, what will happen to the average length of his calls?

10. The meal plan at University A lets students eat as much as they like for a fixed fee of \$500 per semester. The average student there eats 250 pounds of food per semester. University B charges \$500 for a book of meal tickets that entitles the student to eat 250 pounds of food per semester. If the student eats more than 250 pounds, he or she pays \$2 for each additional pound; if the student eats less, he or she gets a \$2 per pound refund. If students are rational, at which university will average food consumption be higher? Explain briefly.

## Chapter 2

2. Ted can wax a car in 20 minutes or wash a car in 60 minutes. Tom can wax a car in 15 minutes or wash a car in 30 minutes. What is each man's opportunity cost of washing a car? Who has comparative advantage in washing cars?

3. Toby can produce 5 gallons of apple cider or 2.5 ounces of feta cheese per hour. Kyle can produce 3 gallons of apple cider or 1.5 ounces of feta cheese per hour. Can Toby and Kyle benefit from specialization and trade? Explain.

4. Nancy and Bill are auto mechanics. Nancy takes 4 hours to replace a clutch and 2 hours to replace a set of brakes. Bill takes 6 hours to replace a clutch and 2 hours to replace a set of brakes. Determine whether anyone has an absolute advantage at either task and, for each task, determine who has a comparative advantage.

9. Susan can pick 4 pounds of coffee in an hour or 2 pounds of nuts. Tom can pick 2 pounds of coffee in an hour or 4 pounds of nuts. Each works 6 hours a day.

a. What is the maximum number of pounds of coffee the two can pick in a day?

b. What is the maximum number of pounds of nuts the two can pick in a day?

c. If Susan and Tom were picking the maximum number of pounds of coffee when they decided that they would like to begin picking 4 pounds of nuts per day, who should pick the nuts and why? How many pounds of coffee would they still be able to pick?

d. Now suppose Susan and Tom were picking the maximum number of pounds of nuts when they decided that they would like to begin picking 8 pounds of coffee per day, who should pick the coffee and why? How many pounds of nuts would they still be able to pick?

e. Would it be possible for Susan and Tom to pick a total of 26 pounds of nuts and 20 pounds of coffee each day? If so, how much of each good should each person pick?

On my honor, as an Aggie, I have neither given nor received unauthorized aid on this assignment.

Signature \_\_\_\_\_