

Problem set 12  
 Prof McFadden  
 Economics 100A  
 Fall 2001

Chapter 33:

1. Nancy rides her bike through the forest with reckless abandon, while Christen likes to hike in the woods. Let  $s$  be the speed in miles per hour that Nancy rides and  $w$  be which Christen walks. Nancy's utility depends on how fast she rides and how many dollars she has, while Michael's utility depends on how fast he walks and how much money he has.

$$U_{\text{nancy}} = 6s^{1/2} - s + m$$

$$U_{\text{michael}} = 4w^{1/2} - w + m$$

- a. how fast will Nancy walk? How fast will Michael ride?
- b. Alas, since Nancy and Michael are both moving in the same forest, there is some chance that Nancy will run into Michael. Suppose that the expected cost to Michael of such an accident depends on the speed that each moves:  $c(s, w) = (s^{0.5}/16) + (w^{0.5}/2)$ . If Michael has to pay the entire cost of an accident, how fast will he walk? How fast will Nancy ride?
- c. Suppose that Nancy now has full liability and must pay any costs that she imposes on Michael. How fast will Michael walk? How fast will Nancy ride?

Chapter 34:

1. East Frisian Press is trying to decide whether it would be profitable to produce a new edition of Microeconomics after one year rather than after two years. If it produces a new edition after one year, it will destroy the used book market and all copies that are purchased will be new copies. In this case, the number of new copies that will be demanded in each of the two years will be  $100(90-p)$ , where  $p$  is the price charged. The variable cost of each copy sold remain \$10
  - a. write an expression for the total number of copies sold over the course of two years if the price is  $p$  in each year. Also, write an expression for the total revenue net of variable costs as a function of  $p$ .
  - b. find the price that maximizes total revenue net of variable costs
  - c. what would be the total number of new books sold in the first year? Second year?
  - d. What will be the total revenue net of variable costs if it markets a new edition after one year?
  - e. Would it be more profitable for east Frisian Press to produce a new edition after one year or after 2 years? Which would be better for students?

Chapter 35

1. Bob and Ray are two hungry economics major who are sharing an apartment for the year. In the flea market, they spot a 25-year-old sofa that would look great in their living room. Bob's utility function is  $u_B(S, M_B) = (1+S)M_B$ , and Ray's utility function is  $u_R(S, M_R) = (2+S)M_R$ . in these expression  $M_B$  and  $M_R$  are the amounts of money that Bob and Ray have to spend on other goods,  $S=1$  if they get the sofa, and  $S=0$  if they don't. Bob has  $W_B$  dollars to spend and Ray has  $W_R$  dollars.
  - a. what is Bob's reservation price for the sofa?
  - b. what is Ray's reservation price for the sofa?
  - c. If Bob has a total of  $W_B = \$100$  and Ray has a total of  $W_R = \$75$  to spend on sofas and other stuff, they could buy the sofa and have a Pareto improvement over not buying so long as the cost of the sofa is no greater than \_\_\_\_\_?