

**FE431: PUBLIC FINANCE**  
**Fall 2006**  
**Professor Schmitt**  
**Homework 10 – due December 4<sup>th</sup>**

1. Questions and Problems Chapter 12, page 329 #4
2. Questions and Problems Chapter 14, page 382 #1
3. Indicate whether the following statement is true, false, or uncertain, and explain your answer.

If a food-stamp program allocates \$100 worth of food stamps to needy families each month, then any family who consumes more than \$100 worth of food each month under the program would be indifferent between the food stamps and \$100 cash.

4. Sarah has two children, Hannah and Rebecca, who receive a weekly allowance. This week Sarah has \$40 to allocate between her two children. Sarah believes that Hannah has utility of income,  $U_H = 10I_H$ . Sarah believes that Rebecca's utility from income is given by  $U_R = 50I_R - 2I_R^2$ .

- a) What is the optimal distribution of the allowance if Sarah follows a utilitarian philosophy of social welfare?
- b) What is the optimal distribution if the social welfare function is  $W = \min(U_H, U_R)$ ?
- c) Finally, assume that Sarah gives all \$40 to Hannah, but Hannah's utility depends on Rebecca's utility. Specifically, assume Hannah's utility is given by:  $U_H = 10I_H + \frac{1}{2}U_R$  and Rebecca's utility is given by:  $U_R = 50I_R - 2I_R^2$ . What, do you predict, will Hannah do with the money? Be as specific as possible.

5. Currently Bob is earning \$1000 in income per month. The price of housing for Bob is \$1 per square foot and the price for all other goods is \$1. Bob's utility for housing and all other goods is given by  $U_B = 200H + HG$  (where H denotes 1 square foot of housing and G denotes 1 unit of all other goods). What is Bob's optimal consumption of housing and all other goods?

- a) If the government provides a housing subsidy of \$400 for each person earning less than \$1500 a month in income, what happens to Bob's consumption of housing and all other goods (show graphically).
- b) If, instead Bob's utility was given by  $U_B = HG - 800H$ , what would his optimal consumption of housing and all other goods with and without the \$400 housing subsidy?
- c) Because both cost the government the same amount (\$400), assuming there are no administrative costs, is the program efficient regardless of Bob's preferences? Explain.