

**Problem Set 3, Econ 2100**  
**Fall, 2009 (Due Wed. Sept. 23)**

1. Name three government-provided goods that are public goods and five government-provided goods that are not public goods.
2. You are having lunch at an all-you-can-eat buffet. If you are rational, what should be your marginal utility from the last morsel of food you swallow?
3. Martha's current marginal utility from consuming orange juice is 75 utils per ounce and her marginal utility from consuming coffee is 50 utils per ounce. If orange juice costs 25 cents per ounce and coffee costs 20 cents per ounce, is Martha maximizing her total utility from the two beverages? If so, explain how you know. If not, how should she rearrange her spending?
4. Toby's current marginal utility from consuming peanuts is 100 utils per ounce and his marginal utility from consuming cashews is 200 utils per ounce. If peanuts cost 10 cents per ounce and cashews cost 25 cents per ounce, is Toby maximizing his total utility from the kinds of nuts? If so, explain how you know. If not, how should he rearrange his spending?
5. Sue gets a total of 20 utils per week from her consumption of pizza and a total of 40 utils per week from her consumption of yogurt. The price of pizza is \$1 per slice, the price of yogurt is \$1 per cup, and she consumes 10 slices of pizza and 20 cups of yogurt each week. True or false: Sue is consuming the optimal combination of pizza and yogurt.
6. When the possibilities of both government failure and market failure are taken into account, does the fact that a government policy causes inefficiency necessarily mean that abolishing the policy would result in greater efficiency? Does the fact that a certain market fails to work efficiently necessarily mean that intervention by government would improve the situation? Carefully explain.
  - b. Explain why an increase in train travel might affect the amount she spends on restaurant meals.
7. Jack and Jill are the only two residents in a neighborhood, and they want to hire a security guard. The value of the guard is \$50 per month to Jack and \$150 per month to Jill. Irrespective of who pays the guard, the guard will protect the entire neighborhood.
  - a. What is the most a guard can charge per month and still be assured of being hired by at least one of them?
  - b. Suppose the competitive wage for a security guard is \$120 per month. The local government proposes a plan whereby Jack and Jill each pay 50 percent of this monthly fee, and asks them to vote on this plan. Will the plan be voted in? Would economic surplus be higher if the neighborhood had a guard?
8. Refer to problem 7. Suppose Jack earns \$1,000 per month and Jill earns \$11,000 per month.
  - a. Suggest a tax on income that would be accepted by majority vote and would pay for the security guard.
  - b. Suppose instead that Jack proposes a tax scheme under which Jack and Jill would each receive the same net benefit from hiring the guard. How much would Jack and Jill pay now? Would Jill agree to this scheme?
  - c. What is the practical problem that prevents ideas like the one in part b from working in real-life situations?
9. Tom has a weekly allowance of \$24, all of which he spends on pizza and movie rentals, whose prices are \$6 per slice and \$3 per rental, respectively.
  - a. If slices of pizza and movie rentals are available only in whole-number amounts, list all possible combinations of the two goods that Tom can purchase each week with his allowance.
  - b. Tom's total utility is the sum of the utility he derives from pizza and movie rentals. If these utilities vary with the amounts consumed as shown in the table, and pizzas and movie rentals are again consumable only in whole-number amounts, how many pizzas and how many movie rentals should Tom consume each week?
 

Units:	0	1	2	3	4	5	6	7	8
TU <sub>Pizza</sub> :	0	20	38	54	68	80	90	98	104
TU <sub>Movie</sub> :	0	40	46	50	54	56	57	57	57