

Name: _____ Section: _____

Date assigned: Thursday, 9/24

Date due: Tuesday, 9/29

Instructions:

- This problem set has 7 questions, for a total of 35 points. The number of points for each question is indicated at the start of the question.
- Please solve the questions on separate pieces of paper that are to be turned in with your name written on top, **stapled**.

1: (4 points total)

Bill's demand for Swedish Fish (private good) is $Q = 20 - 2P$, and Ted's demand is $Q = 10 - P$.

- Write down an equation for the social marginal benefit of the consumption of Swedish Fish if Swedish Fish are private goods. (2 points)
- Write down an equation for the social marginal benefit of the consumption of Swedish Fish if Swedish Fish are public goods. (2 points)

2: (5 points total)

The citizens of Balaland used to pave 120 miles of roadways per year. After the government of Balaland began paving 100 miles of roadways per year itself, the citizens cut back their paving to 30 miles per year, for a total number of roadway miles paved per year of only 130 miles. What might be happening here?

3: (8 points total)

Suppose 10 people each have the demand $Q = 20 - 4P$ for streetlights and 5 people have the demand $Q = 18 - 2P$ for streetlights. The cost of building each streetlight is 3. If it is impossible to purchase a fractional number of streetlights, how many streetlights are socially optimal?

4: (4 points total)

You are trying to decide where to go on vacation. In country A, your risk of death is 1 in 10,000, and you'd pay \$6,000 to go on that vacation. In country B, your risk of death is 1 in 20,000, and you'd pay \$9,000 to go on that vacation. Supposing that you're indifferent between these two destinations, save for the differential risk of death, what does your willingness to pay for these vacations tell you about how much you value your life?

5: (4 points total)

The city of Charlotte added a new subway station in a neighborhood between two existing stations. After the station was built, the average house price increased by \$10,000 and the average commute time fell by 15 minutes per day. Suppose that there is one commuter per household, that the average commuter works 5 days a week, 50 weeks a year, and that the benefits of reduced commuting time apply to current and future residents forever. Assume an interest rate of 5%. Produce an estimate of the average value of time for commuters based on this information.

6: (4 points total)

Suppose you prefer working 40 hours per week to 20 hours, and prefer working 32 hours per week to either 20 or 40 hours. However, you are forced to work either 20 hours or 40 hours per week. Is your hourly wage rate an accurate reflection of the value of your time? Explain.

6: (6 points total)

A new public works project requires 200,000 hours of labor to complete.

- (a) Suppose the labor market is perfectly competitive and the market wage is \$15. What is the opportunity cost of the labor employed for the project? (2 points)
- (b) Suppose that there is currently unemployment among workers, and that there are some workers who would willingly work for \$10 per hour. What is the opportunity cost of the labor employed? Does this vary depending on the fraction of would-be unemployed workers hired for the project? (2 points)
- (c) If your answers to (a) and (b) differ, explain why. (2 points)