

# HOMework 1

Intermediate Microeconomics EC 308-004  
September 13, 2007

Name: \_\_\_\_\_

by writing my name i swear by the honor code

**Read all of the following information before starting the Assignment:**

- You are allowed to work together on the homework. However, when it comes time for you to write up the solutions, you are required to do this on your own.
- Show all work, clearly and in order, if you want to get full credit. I reserve the right to take off points if I cannot see how you arrived at your answer (even if your final answer is correct).
- Justify your answers algebraically whenever possible to ensure full credit. When you do use your calculator, sketch all relevant graphs and explain all relevant mathematics.
- Circle or otherwise indicate your final answers.
- Please keep your written answers brief; be clear and to the point. I will take points off for rambling and for incorrect or irrelevant statements.
- This assignment has 5 problems and is worth 100 points. It is your responsibility to make sure that you have all of the answers!
- This assignment is due next Thursday, September 20 in class.
- Good luck!

1. (15 points) PROBLEM 1: This question has 3 parts:

a. (5 pts) PART A: Suppose the Social Security Administration (SSA) would like to guarantee the purchasing power of social security payments to the elderly does not diminish. That is, the real value of the payments does not decrease. The CPI in 1990 was 130.7 and the CPI in 1998 was 163.0. How much does the SSA need to increase payments from 1990 to 1998 to accomplish this objective?

b. (5 pts) PART B: The first column of the following table describes the price movement of AOL corporation stock over the last 5 years. The second column gives the period's CPI. Calculate the real value of the stock for each time period using year 5 as the base year. If you purchased \$1,000 worth of AOL stock in year 1, what has happened to the purchasing power of your original \$1,000 investment when you sell stock in year 5?

<i>Year</i>	AOL	CPI
\$1996	\$4.00	147.8
\$1997	\$3.84	155.3
\$1998	\$7.00	163.0
\$1999	\$37.00	165.4
\$2000	\$70.00	172.1

c. (5 pts) PART C: For each city across the U.S., economists construct a price index for a similar basket of goods. In Los Angeles the index is 127.3 and in Dallas the index is 94.8. If you have been offered \$137,000 for a job in Los Angeles and \$117,000 for a similar job in Dallas, which job affords you the highest purchasing power of the bundle of goods in the price index? Use the Los Angeles value as the base year.

**2.** (20 points) PROBLEM 2: The inverse demand curve for product X is given by:  $P_X = 25 - 0.005Q + 0.15P_Y$ , where  $P_X$  represents price in dollars per unit,  $Q$  measures rate of sales in pounds per week, and  $P_Y$  represents selling price of another product Y in dollars per unit. The inverse supply curve of product X is given by:  $P_X = 5 + 0.004Q$ .

**a.** (10 pts) PART A: Determine the equilibrium price and sales of X. Let  $P_Y = \$10$ .

**b.** (10 pts) PART B: Determine whether X and Y are substitutes or complements.

**3.** (*20 points*) PROBLEM 3: The following problem has 2 parts:

**a.** (*10 pts*) PART A: Suppose a new discovery in computer manufacturing has just made computer production cheaper. Also the popularity and usefulness of computers continues to grow. Use supply and demand analysis to predict how these shocks will affect equilibrium price and quantity of computers. Is there enough information to determine if market prices rise or fall? Why?

**b.** (*10 pts*) PART B: Historically, investors have considered gold commodities to be a good investment to preserve wealth in times of inflation. If investors are no longer worried about inflation and gold demand decreases, what do you expect will happen to gold prices? How would your answer change if you learn that a recent gold mine discovery will increase the supply of gold?

**4.** (*25 points*) **PROBLEM 4:** In a city with a medium sized population, the equilibrium price for a city bus ticket is \$1.00 and the number of riders each day is 10,800. The short-run price elasticity of demand is -0.60, and the short-run elasticity of supply is 1.0.

**a.** (*10 pts*) **PART A:** Estimate the short-run linear supply and demand curves for bus tickets.

**b.** (*5 pts*) **PART B:** If the demand for bus tickets increased by 10% because of a rise in the world price of oil, what would be the new equilibrium price of bus tickets?

**c. (5 pts)** PART C: If the city council refused to let the bus company raise the price of bus tickets after the demand for tickets increases (see (B) above), what daily shortage of tickets would be created?

**d. (5 pts)** PART D: Would the bus company have an incentive to increase the supply in the long-run given the city council's decision in (C) above? Explain your answer.

5. (20 points) PROBLEM 5: This question has two parts:

a. (10 pts) PART A: The following combination of goods  $X$  and  $Y$  represent various market baskets. Consumption is measured in pounds per month. Explain which market

<i>MarketBasket</i>	Units of X	Units of Y
A	4	6
B	16	7
C	15	3
D	3	2

basket(s) is(are) preferred to others(s), and if there is any uncertainty over which is preferable, point this out as well.

b. (10 pts) PART B: Consider Gary's utility function:  $U(X, Y) = 5XY$ , where  $X$  and  $Y$  are two goods. If the individual consumed 10 units of  $X$  and received 250 units of utility, how many units of  $Y$  must the individual consume? Would a market basket of  $X=15$  and  $Y=3$  be preferred to the above combination? Explain.

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