

due : Wednesday October 17 2:30 pm

Do all 5 questions. Each counts 20%.

1. Could the following 3 equations be Hicksian demand functions (if the reference level of utility u were high enough that $u > \ln p_1 - \ln p_2 - \ln p_3$)? Explain briefly.

$$x_1(\mathbf{p}, u) = u - \ln p_1 + \ln p_2 + \ln p_3$$

$$x_2(\mathbf{p}, u) = \frac{p_1}{p_2}$$

$$x_3(\mathbf{p}, u) = \frac{p_1}{p_3}$$

2. Find all the violations of the strong and weak axioms of revealed preference in the following table, which indicates the prices p^t of three different commodities at four different times, and the quantities x^t of the 3 goods chosen at the four different times. (For example, the second row indicates that the consumer chose the bundle $\mathbf{x} = (30, 40, 30)$ when the price vector was $\mathbf{p} = (2, 1, 2)$.)

t	p_1^t	p_2^t	p_3^t	x_1^t	x_2^t	x_3^t
1	2	2	2	50	20	30
2	2	1	2	30	40	30
3	3	2	2	60	30	8
4	2	2	1	50	40	20

3. If a person was an expected utility maximizer with a utility–wealth function

$$u(W) = W^2 - \frac{8000000}{W}$$

(where W is her wealth, in thousands of dollars), give an example of a gamble g for which $E[u(g)] < u(Eg)$ for this person, and an example of a gamble g' for which $E[u(g')] > u(Eg')$.

4. How much insurance would a person buy against a loss of L dollars, if the person had initial wealth of $W > L$, if the probability of the loss were π , and if the price of a dollar of insurance coverage were p dollars (with $p \geq \pi$), and if the person had a constant coefficient of relative risk aversion of $\beta > 0$?

5. For what values of (x_1, x_2, x_3) does the production function

$$f(x_1, x_2, x_3) = x_1x_2 + 10\frac{x_3}{x_3 + 1}$$

exhibit locally increasing returns to scale?