

due : Wednesday February 9 before class

Do all 5 questions. Each counts 20%.

1. The table below indicates the prices \mathbf{p}^t of three commodities, at 3 different times t , and the consumption bundle \mathbf{x}^t actually chosen by the consumer at each of the three times.

What can be said about the consumer's preferences over the 3 bundles \mathbf{x}^t ?

t	p_1^t	p_2^t	p_3^t	x_1^t	x_2^t	x_3^t
1	3	2	1	4	6	12
2	2	5	1	5	2	10
3	8	5	4	5	8	10

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.

t	p_1^t	p_2^t	p_3^t	x_1^t	x_2^t	x_3^t
1	1	1	5	10	10	10
2	4	2	1	5	20	9
3	3	3	3	7	12	15
4	3	1	2	8	15	12

3. *i* If a person's utility-of-wealth function has the equation $U(W) = A - e^{-\alpha W}$, where A and α are positive parameters, what is her coefficient of absolute risk aversion?

ii If a person could invest her wealth in a safe asset, offering a certain rate of return $r_s \geq 0$, or a risky asset, which offers the return $r_g > r_s$ with some probability π , and the return $r_b < r_s$ with probability $1 - \pi$, how much wealth should she invest in the safe asset, and how much in the risky asset, if her utility-of-wealth function is $U(W) = A - e^{-\alpha W}$?

4. What is the risk premium for an investment which yields a prize of $G > 1$, with probability $1/G$, (and nothing with probability $(G - 1)/G$), to a person with the utility-of-wealth function

$$U(W) = A - \frac{b}{W}$$

where $b > 0$?

5. If a production function $f(x_1, x_2)$ has the equation

$$f(x_1, x_2) = \left[a + b \frac{x_1}{x_2} \right]^{-1} x_1$$

for positive parameters a , and b , calculate the marginal product of each input, and the marginal rate of technical substitution. Does the production function exhibit decreasing, constant, or increasing returns to scale? Explain briefly.