

due : Wednesday November 21    before class

Do all 5 questions. Each counts 20%.

1. What does the contract curve look like for a 2–person, 2–good exchange economy, with a total endowment of 10 units of good 1 and 30 units of good 2, if the preferences of the two people could be represented by the utility functions

$$u^1(x_1^1, x_2^1) = \ln x_1^1 + \ln x_2^1$$

$$u^2(x_1^2, x_2^2) = 112 - \frac{1}{(x_1^2)^2} + \ln x_2^2$$

where  $x_j^i$  is person  $i$ 's consumption of good  $j$ ?

2. What are all the allocations in the core of a 3–person, 2–good economy, in which each person's preferences can be represented by the utility function

$$u^i(x_1^i, x_2^i) = x_1^i + 2\sqrt{x_2^i}$$

where  $x_j^i$  is person  $i$ 's consumption of good  $j$ , and where the endowments  $e^i$  of the three people are  $e^1 = (4, 0)$ ,  $e^2 = (0, 4)$ ,  $e^3 = (2, 2)$ ?

3. In the economy described in question #1 above, suppose that person 2's endowment of the two goods is  $e^2 = (\alpha, 8)$ . Suppose as well that person 1 chooses to consume 8 units of good 1 in the resulting competitive equilibrium.

What does  $\alpha$  equal?

4. Calculate the competitive equilibrium for the 3–person, 2–good economy described in question #2.

**over**

5. Find all the pure-strategy Nash equilibria in the following strategic-form two-person game.

	<i>a</i>	<i>b</i>	<i>c</i>	<i>d</i>	<i>e</i>	<i>f</i>	<i>g</i>
<i>A</i>	(0, 0)	(0, 8)	(0, 15)	(0, 17.7)	(0, 20)	(0, 23)	(0, 24)
<i>B</i>	(8, 0)	(4, 4)	(2, 9)	(1, 10.7)	(0, 12)	(-2, 13)	(-4, 12)
<i>C</i>	(15, 0)	(9, 2)	(6, 6)	(4.5, 7.2)	(3, 8)	(0, 8)	(-3, 6)
<i>D</i>	(17.7, 0)	(10.7, 1)	(7.2, 4.5)	(5.5, 5.5)	(3.7, 6)	(0.2, 5.5)	(-3.2, 3)
<i>E</i>	(20, 0)	(12, 0)	(8, 3)	(6, 3.7)	(4, 4)	(0, 3)	(-4, 0)
<i>F</i>	(23, 0)	(13, -2)	(8, 0)	(5.5, 0.2)	(3, 0)	(-2, -2)	(-7, -6)
<i>G</i>	(24, 0)	(12, -4)	(6, -3)	(3, -3.2)	(0, -4)	(-6, -7)	(-12, -12)