

**Economics 101
Spring 2001
Section 4 - Hallam
Problem Set #4**

Due date: February 19, 2000

1. Gilligan and the Skipper live on an island. The following table represents their **output in a day** of work.

	Turtles	Coconuts
Gilligan	30	6
Skipper	60	10

- a. Who has an absolute advantage in turtles? (Show work)
 - b. Who has an absolute advantage in coconuts? (Show work)
 - c. Who has a comparative advantage in turtles? (Show work)
 - d. Who has a comparative advantage in coconuts? (Show work)
2. Brazil and Argentina can both produce soybean and cattle. The following data represents the cost of producing each item valued in the local currency. Soybean are measured in bushel, cattle in head.

Cost per unit data

	Soybean (per bushel)	Cattle (per head)
Brazil	9 real	1440 real
Argentina	5 pesos	750 pesos

- a. What is the opportunity cost of producing one more head of cattle in Brazil? (Show work)
- b. What is the opportunity cost of producing one more head of cattle in Argentina? (Show work)
- c. What is the opportunity cost of producing one more bushel of soybean in Brazil? (Show work)
- d. What is the opportunity cost of producing one more bushel of soybean in Argentina? (Show work)
- e. Which country has an absolute advantage in producing cattle? (Show work)
- f. Which country has a comparative advantage in producing cattle? (Show work)
- g. Which country has a comparative advantage in producing soybean? (Show work)

3. Consider the following data on soybean and cattle production in Brazil and Argentina where the data is **production per day**. Assume that the production possibility frontier is linear. Be sure to show your work on each problem.

	Soybean	Cattle
Argentina	3,000,000	0
Argentina	0	20,000
Brazil	8,000,000	0
Brazil	0	50,000

- If Argentina produced 2,700,000 bushels of soybeans, how many total cattle could it produce?
 - If Argentina produced 2,100,000 bushels of soybeans, how many total cattle could it produce?
 - If Argentina produced 750,000 bushels of soybeans, how many total cattle could it produce?
 - If Argentina produced 15,000 cattle, how many bushels of soybeans could it produce?
 - If Argentina produced 10,000 cattle, how many bushels of soybeans could it produce?
 - If Argentina produced 5,000 cattle, how many bushels of soybeans could it produce?
 - If Brazil produced 6,400,000 bushels of soybeans, how many total cattle could it produce?
 - If Brazil produced 7,200,000 bushels of soybeans, how many total cattle could it produce?
 - If Brazil produced 4,800,000 bushels of soybeans, how many total cattle could it produce?
 - If Brazil produced 5,000 cattle, how many bushels of soybeans could it produce?
 - Suppose that Brazil is producing 20,000 cattle and 4,800,000 bushels of soybean while Argentina is producing 10,000 cattle and 1,500,000 bushels of soybean. What is total soybean production?
 - Now suppose Brazil decreases cattle production to 15,000 while Argentina increases cattle production to 15,000. What is total soybean production?
4. Consider the following hypothetical data on cloth and wine production in England and Portugal. Cloth is measured in 1,000 yards, wine in measured in 1,000 liters. Assume that capital is freely mobile so only labor costs matter. Also assume that real wages will tend to equalize so that only labor quantities matter. The data below gives the number of **workers required per unit of output**.

	Cloth	Wine
England	100 workers	120 workers
Portugal	90 workers	80 workers

- Who has a comparative advantage in cloth? (Show work)
 - Who has a comparative advantage in wine? (Show work)
 - Convert the data to **output per worker** and make a new table.
 - Using the new data, show who has the comparative advantage in cloth.
5. Consider a demand curve written as $Q^D = 100 - \frac{1}{4}P$.
- What is the inverse demand curve?
 - Find the elasticity of demand as quantity goes from 80 to 85.
 - Find the elasticity of demand as quantity goes from 10 to 15.
 - Find the elasticity of demand as price goes from 200 to 220.
 - Which of the three points in b-d has an elastic demand?
 - Which of the three points in b-d has an inelastic demand?

6. Work question 1 from Skills and Tools in Chapter 4.
7. Work question 2 from Skills and Tools in Chapter 4.
8. Work question 3 from Skills and Tools in Chapter 4.
9. Work question 6 from Skills and Tools in Chapter 4.
10. Work question 9 from Skills and Tools in Chapter 4.
11. Consider the following data on demand for 2 goods, shoes (S) and coats (C). The notation is as follows:
 PS = price of shoes, PC = price of coats, I = income, DS = demand for shoes, DC = demand for coats. There are four situations shown.

Income = 1000, PC = 10					Income = 1000, PC = 10				
PS	PC	I	DS	DC	PS	PC	I	DS	DC
10.00	10.00	1000.00	19.20	80.80	10.00	10.00	1000.00	19.20	80.80
14.00	10.00	1000.00	13.26	81.44	14.00	10.00	1000.00	13.26	81.44
18.00	10.00	1000.00	9.96	82.08	18.00	10.00	1000.00	9.96	82.08
22.00	10.00	1000.00	7.85	82.72	22.00	10.00	1000.00	7.85	82.72
26.00	10.00	1000.00	6.40	83.36	26.00	10.00	1000.00	6.40	83.36
30.00	10.00	1000.00	5.33	84.00	30.00	10.00	1000.00	5.33	84.00
34.00	10.00	1000.00	4.52	84.64	34.00	10.00	1000.00	4.52	84.64
38.00	10.00	1000.00	3.87	85.28	38.00	10.00	1000.00	3.87	85.28
42.00	10.00	1000.00	3.35	85.92	42.00	10.00	1000.00	3.35	85.92
46.00	10.00	1000.00	2.92	86.56	46.00	10.00	1000.00	2.92	86.56
50.00	10.00	1000.00	2.56	87.20	50.00	10.00	1000.00	2.56	87.20

Income = 1000, PC = 60					Income = 2000, PC = 10				
PS	PC	I	DS	DC	PS	PC	I	DS	DC
10.00	60.00	1000.00	23.20	12.80	10.00	10.00	2000.00	39.20	160.80
14.00	60.00	1000.00	16.11	12.91	14.00	10.00	2000.00	27.54	161.44
18.00	60.00	1000.00	12.18	13.01	18.00	10.00	2000.00	21.07	162.08
22.00	60.00	1000.00	9.67	13.12	22.00	10.00	2000.00	16.95	162.72
26.00	60.00	1000.00	7.94	13.23	26.00	10.00	2000.00	14.09	163.36
30.00	60.00	1000.00	6.67	13.33	30.00	10.00	2000.00	12.00	164.00
34.00	60.00	1000.00	5.69	13.44	34.00	10.00	2000.00	10.40	164.64
38.00	60.00	1000.00	4.93	13.55	38.00	10.00	2000.00	9.14	165.28
42.00	60.00	1000.00	4.30	13.65	42.00	10.00	2000.00	8.11	165.92
46.00	60.00	1000.00	3.79	13.76	46.00	10.00	2000.00	7.27	166.56
50.00	60.00	1000.00	3.36	13.87	50.00	10.00	2000.00	6.56	167.20

- a. Find the price elasticity of demand for shoes with an income of \$1,000 when the price of coats is \$10.00 as the price of shoes goes from \$30 to \$34.
- b. Find the price elasticity of demand for shoes with an income of \$2,000 when the price of coats is \$10.00 as the price of shoes goes from \$30 to \$34.

- c. Find the price elasticity of demand for shoes with an income of \$1,000 when the price of coats is \$10.00 as the price of shoes goes from \$42 to \$46.
- d. Find the price elasticity of demand for shoes with an income of \$2,000 when the price of coats is \$10.00 as the price of shoes goes from \$42 to \$46.
- e. Find the price elasticity of demand for coats with an income of \$1,000 when the price of shoes is \$30.00 as the price of coats goes from \$10 to \$60.
- f. Find the price elasticity of demand for coats with an income of \$1,000 when the price of shoes is \$42.00 as the price of coats goes from \$10 to \$60.
- g. Find the income elasticity of shoes when the price of shoes is \$22, the price of coats is \$10, and income goes from \$1,000 to \$2,000.
- h. Find the income elasticity of shoes when the price of shoes is \$46, the price of coats is \$10, and income goes from \$1,000 to \$2,000.
- i. Find the cross price elasticity of shoe demand with respect to the price of coats when income is \$1,000, the price of shoes is \$30.00 and the price of coats goes from \$10 to \$60.
- j. Find the cross price elasticity of shoe demand with respect to the price of coats when income is \$1,000, the price of shoes is \$42.00 and the price of coats goes from \$10 to \$60.
- k. Find the cross price elasticity of coat demand with respect to the price of shoes when income is \$2,000, the price of coats is \$10.00 and the price of shoes goes from \$22 to \$26.
- l. Find the cross price elasticity of coat demand with respect to the price of shoes when income is \$1,000, the price of coats is \$60.00 and the price of shoes goes from \$38 to \$42.

12. On a piece of graph paper, draw budget lines for the following situations. Use a separate graph for each letter but combine budget lines within a letter. In each case describe in a few words what the change represents.
- a. $p_1 = 2, p_2 = 4, I = 36$
 $p_1 = 2, p_2 = 4, I = 24$
 $p_1 = 2, p_2 = 4, I = 48$
 - b. $p_1 = 2, p_2 = 4, I = 36$
 $p_1 = 4, p_2 = 4, I = 36$
 $p_1 = 1, p_2 = 4, I = 36$
 - c. $p_1 = 2, p_2 = 4, I = 36$
 $p_1 = 2, p_2 = 3, I = 36$
 $p_1 = 2, p_2 = 6, I = 36$
 - d. $p_1 = 2, p_2 = 6, I = 36$
 $p_1 = 2, p_2 = 4, I = 36$
 $p_1 = 2, p_2 = 4, I = 24$
13. Draw a budget line and a subsequent budget line for each of the following situations.
- a. An individual is laid off from her job.
 - b. There is a tax on good 2.
 - c. An individual wins the lottery at the same time that the price of good 1 rises.
 - d. The price of good 1, good 2, and income all rise by the same proportion.
 - e. The price of good 1 and good 2 both fall by the same percentage amount (same proportion).
 - f. The price of good 1 rises and the price of good 2 falls while income remains the same.