Shomu Banerjee **Spring 2018**
ECON 201-2

Name……Group……

TEST 1

- **Answer all questions.**
- **Show your derivations. Use the back of the page if you need more space.**
- **Make sure your reasoning is clearly expressed in your answer.**
- **Label all your graphs.**
- **Good luck!**

Do not write in this area!
Question 1 (20 points)

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Question 2 (20 points)

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Question 3 (20 points)

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Question 4 (20 points)

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Question 5 (20 points)

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1. Steel is produced in 2 countries, *A* and *B*. Their inverse demands and supplies are given in the table below:

Country	*Inverse demand*	*Inverse supply*
A	$p = 150 - Q_A^d$	$p = 10 + 0.5Q_A^s$
B	$p = 80 - Q_B^d$	$p = Q_B^s$

(a) (5 points) Calculate the world equilibrium price, p. What are the quantities demanded in each market, Q_A^* and Q_B^*, and *A*'s imports? *Show your work!*

p^*	Q_A^*	Q_B^*	*A*'s imports

(b) (10 points) Country *A* imposes a tariff of $10 per unit on the exports of *B* **and** gives a $5 per-unit subsidy to *A*'s producers. Calculate the prices p_A^* and p_B^* after the tariff, and the tariff revenue. *Show your work and reasoning!*

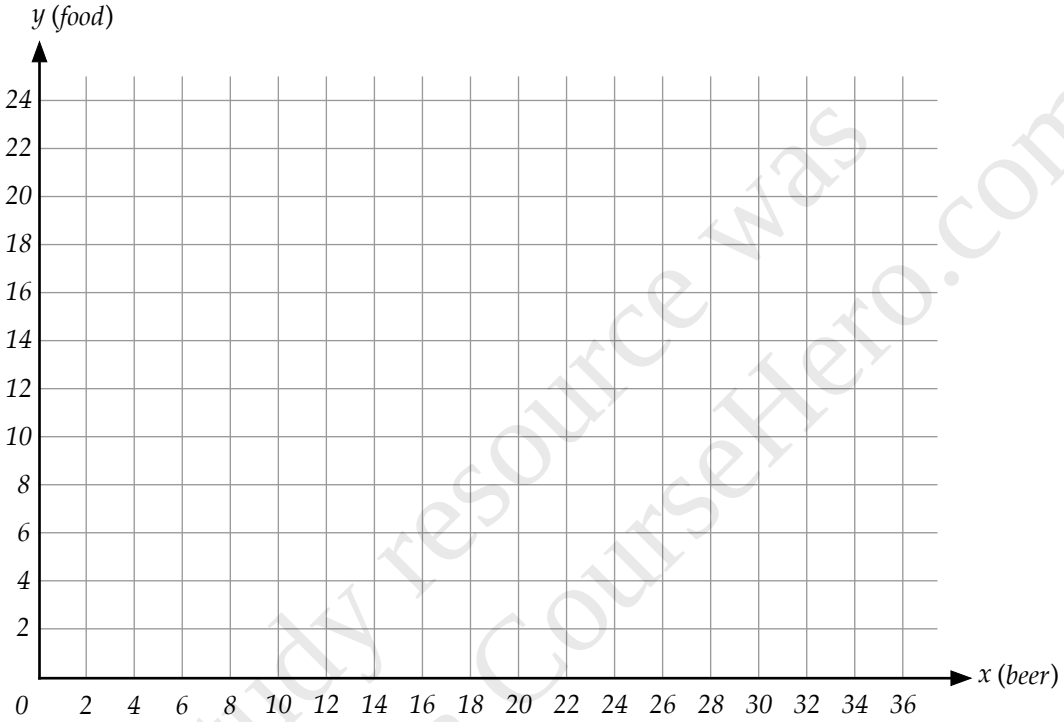
p_A^*	p_B^*	*Tariff revenue*

(c) (5 points) What is the combined incidence of the tax and subsidy on buyers and sellers in the two countries? Write a number (positive, negative or zero) in the 4 cells below to indicate the incidence per ton on each party. *Show your work and reasoning!*

A buyers	*A sellers*	*B buyers*	*B sellers*

2. Pat and Tim are brothers who live in the little town of Boondock. Each earns a weekly income of \$24 which they can spend on beer (x) and food (y). The price of food is \$1 per unit. The price of beer is \$1 per mug in Boondock but one can only drink up to 12 mugs. In the city of Maxopolis, beer is 50 cents a mug and there is no drinking restriction. However, traveling to and from Maxopolis takes time and costs \$9. Therefore, Pat and Tim can only spend their weekly income either in Boondock or in Maxopolis; they cannot do both!

(a) Draw Pat's (or Tim's) budget constraint (they are identical).



(b) Suppose Pat's utility function is

$$u^P(x^P, y^P) = \min\{x^P, 3y^P\},$$

and Tim's utility function is

$$u^T(x^T, y^T) = \min\{2x^T, y^T\}.$$

Indicate the place where each person spends his income and the quantities of beer and food consumed by each. *Briefly explain your reasoning using the figure above!*

Pat consumes in	*Tim consumes in*	x^P	y^P	x^T	y^T

3.(a) (6 points) Suppose there are 6 baskets of fruit consisting of some combination of an apple (a), a banana (b), and a cantaloupe (c):

$$B_1 = \{a\},\ B_2 = \{b\},\ B_3 = \{c\},\ B_4 = \{a, b\},\ B_5 = \{b, c\},\ B_6 = \{a, b, c\}.$$

We define a binary relation *is contained in* over these baskets if the fruit/fruits in a basket are contained in another. We write this binary relation as ©. For example, $B_1 \copyright B_4$, or $B_2 \copyright B_6$, etc.

Is the binary relation © reflexive, total, and transitive? Indicate in the box below.

Property	*Yes*	*No*
Reflexive		
Total		
Transitive		

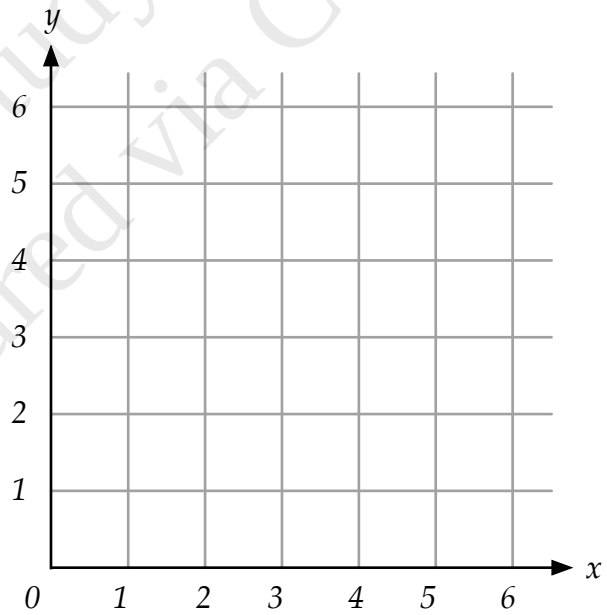
Briefly explain your choice of answer in each case!

Reflexive:

Total:

Transitive:

(b) (6 points) **(c)** Knut's utility function over commodities x and y is given by the utility function $u(x, y) = \min\{4x, x + y, 2y\}$. Draw the indifference curve that gives him a utility of 4.



(c) (8 points) Suppose Clark's demand functions are given by

$$x = \frac{m}{p_x + p_y} \text{ and } y = \frac{m}{p_x + p_y}.$$

Calculate the own-price elasticity ε_{xx}, and the income elasticity η_y to two decimal places when $p_x = 4$, $p_y = 1$, and $m = 100$. *Show your work!*

ε_{xx}	η_y

4. Kenneth has a utility function given by $u(x, y) = (x - 1)(y - 1)$. Calculate his demand functions for x and y as a function of the prices p_x, p_y, and income m. Show your work!

(a) Calculate Kenneth's interior demand functions for x and y.

x	y

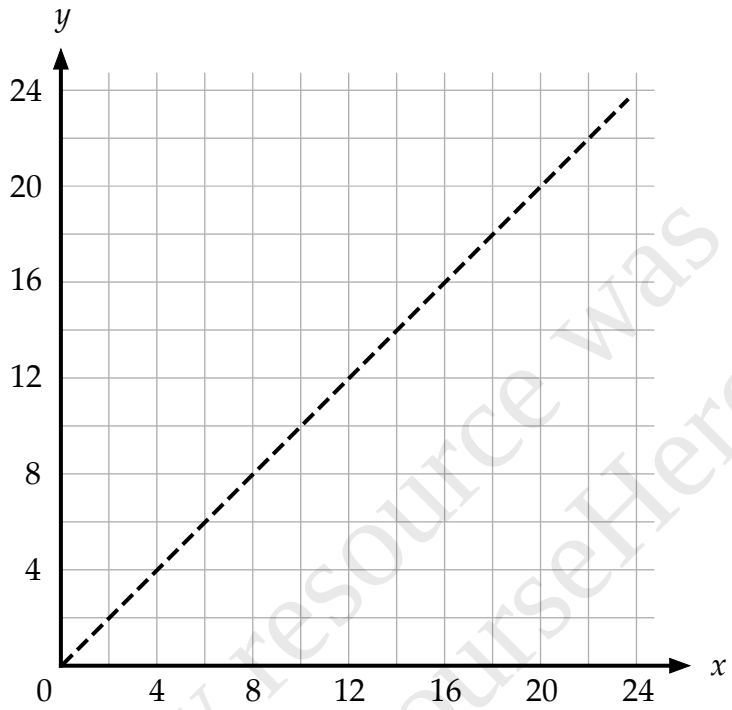
(b) Is there a possibility that Kenneth could have a corner solution? If there isn't, write 'None' below. If there is one or more, write down Kenneth's corner solution demand functions for x and y, and the condition under which this is the solution.

x	y	Condition

x	y	Condition

5.(a) Bengt's utility function is $u = \min\{2x, x + y\}$. His indifference curves have kinks that lie along the dashed line. Above the dashed line, his indifference curves are vertical, while below they have a slope of –1.

Bengt's income is \$120, and the price of y is \$10. Draw his PCC as the price of x falls from \$20 to \$5. *Label it clearly!!*



(b) Bengt's utility function is $u = \min\{2x, x + y\}$. His indifference curves have kinks that lie along the dashed line. Above the dashed line, his indifference curves are vertical, while below they have a slope of –1.

(i) Bengt's income is \$120, the price of x is \$20, and the price of y is \$10. Draw his **(1)** old budget constraint and **(2)** label the utility maximizing point as A.

(ii) Bengt's income remains at \$120, the price of y is still \$10, but the price of x falls to \$5. Draw **(3)** his new budget constraint, **(4)** label the utility maximizing point as C, and **(5)** draw the new indifference curve that passes through C.

(iii) Break up the price effect into substitution and income effects graphically. **(6)** Label the B point. Be sure to **(7)** draw the budget line that determines this point!

(iv) How much more x does Bengt buy as a result of his substitution effect?

SE for x

(v) How much more or less of x does Bengt buy as a result of his income effect?

IE for x