

Midterm Exam No. 1 - *Answers*
October 6, 2008

Answer all questions on these sheets. Plan and budget your time. The questions are worth a total of 60 points, as indicated, and you will have 80 minutes to complete the exam.

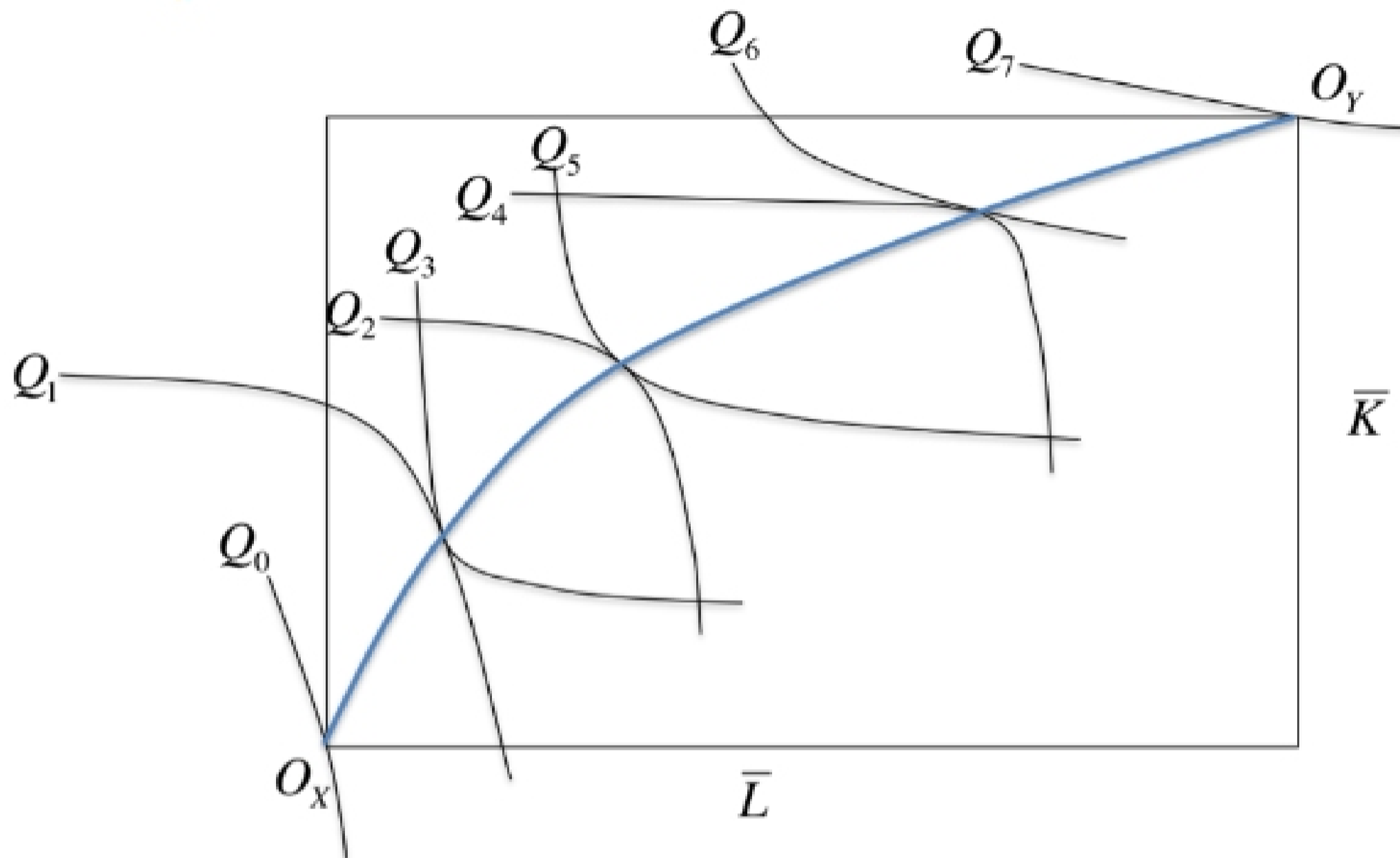
1. (6 points) There are two ways to justify the use of community indifference curves to represent the quantities of goods that an economy of many consumers will demand. One way uses a single assumption, which you should indicate in column 1 below. The other uses two assumptions together, both of which you should indicate in column 2 below. Thus, you should insert one check mark (✓) in the column labeled 1 and two check marks in the column labeled 2, in order to indicate the two ways of justifying community indifference curves.

	1	2
a. Consumers require a positive quantity of each good, regardless of prices.	_____	_____
b. Preferences are homothetic	_____	_____ ✓
c. Consumers wish to consume more of the capital-intensive good than the labor-intensive good.	_____	_____
d. The value of consumption equals income	_____	_____
e. The distribution of income is fixed.	_____ ✓	_____
f. Consumers are willing to substitute one good for another when prices change.	_____	_____
g. Preferences of all consumers are the same.	_____	_____ ✓

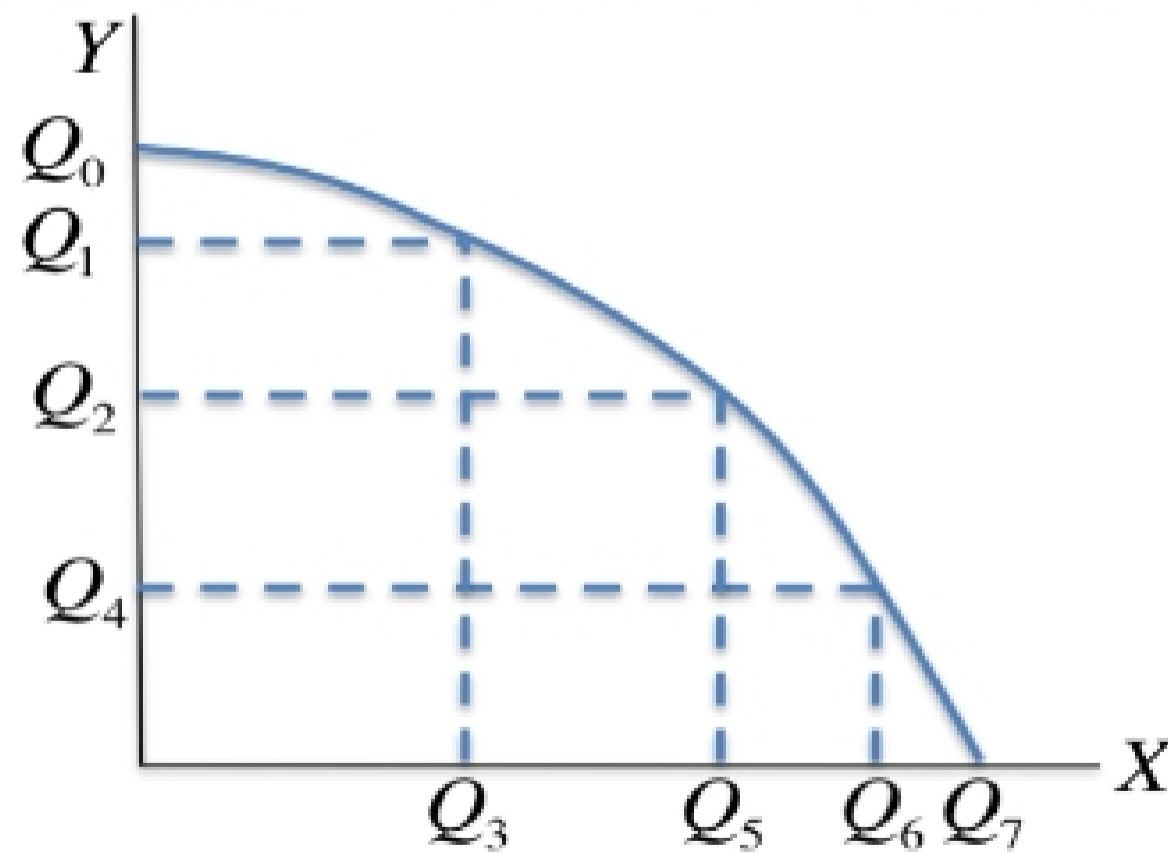
2. (4 points) The table shows output per unit labor for two countries and two goods. If these are the only countries and only goods in the world, indicate the country that...

		Output produced per unit of labor	
		Country	
		A	B
...has comparative advantage in good X:	_____ B _____	X	100
...has absolute advantage in good Y:	_____ B _____	Y	600

3. (6 points) The figure below shows a production Edgeworth Box, with origins indicated for the inputs of capital, K , and labor, L , into production of goods X and Y . Eight isoquants are shown, reflecting standard constant-returns-to-scale production functions. These are labeled Q_0, \dots, Q_7 at the left ends of the isoquants, but it is left to you to know which good, X or Y , these refer to and which of these quantities are larger or smaller than others.
- a. (2 points) In the figure, draw the efficiency locus that is implied by these isoquants.



- b. (4 points) On the axes below, draw the production possibility frontier for this economy, and identify along the appropriate axes the eight quantities Q_0, \dots, Q_7 .



4. (10 points) Consider an economy that produces and consumes two goods, X and Y , in autarky and free trade. In autarky it produces quantities X_p^a, Y_p^a and consumes quantities X_c^a, Y_c^a , at prices p_X^a, p_Y^a . In free trade it faces world prices p_X^W, p_Y^W , and at those prices it produces X_p^f, Y_p^f and consumes X_c^f, Y_c^f . Using this notation in the space below, state and prove – using appropriate equations and inequalities – that this economy gains (or at least does not lose) from trade. Be sure to state the assumptions that you use, and indicate where in the proof these assumptions are used.

Assumption 1: Competitive industries maximize the value of national output at the prevailing prices.

Assumption 2: Trade is balanced (thus expenditure equals income)

Theorem (Gains from Trade): Economic welfare of a country is at least as great with free trade as in autarky. Or, more formally, at free trade prices consumers could afford to buy what they bought in autarky:

$$p_X^W X_c^f + p_Y^W Y_c^f \geq p_X^W X_c^a + p_Y^W Y_c^a$$

Proof:

$$\begin{aligned} p_X^W X_c^f + p_Y^W Y_c^f &= p_X^W X_p^f + p_Y^W Y_p^f && \text{by Assumption 2} \\ &\geq p_X^W X_p^a + p_Y^W Y_p^a && \text{by Assumption 1} \\ &= p_X^W X_c^a + p_Y^W Y_c^a && \text{by definition of autarky} \end{aligned}$$