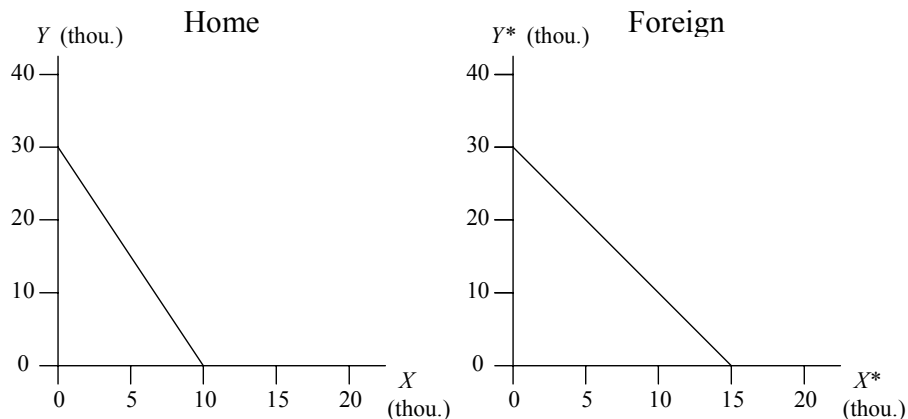


Midterm Exam No. 1
July 16, 2003

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

1. [34 points] The graph below shows Ricardian production possibility frontiers for two countries, Home and Foreign, producing thousands of units of two goods, X and Y . Assume that Home is endowed with 50 units and Foreign with 60 units of labor.



- (4 points) What are the labor productivities (α , α^* , β , β^* , in units per worker) of the two countries in producing the two goods?
- (4 points) Which country, if any, has an absolute advantage in good X ? Which has absolute advantage in good Y ? Which has comparative advantage in good X ? Which has comparative advantage in good Y ?
- (16 points) Copy the diagram into your blue book, keeping approximately the proportions (and thus absolute and comparative advantages) shown above. Then use the diagram as you've drawn it to illustrate, for plausible preferences, both autarky and free-trade equilibria for a world consisting only of these two countries. If there are quantities, distances, or slopes that should be equal in order for your diagram to represent equilibrium, be sure either that they look equal or that you say that they are. In your diagram, label the points where production takes place as P^A and P^{*A} for autarky in the Home and Foreign countries respectively, and P^T and P^{*T} for trade. Label the points where consumption takes place correspondingly as C^A , C^{*A} , C^T , and C^{*T} .
- (10 points) Suppose now that labor productivity in the Y sector increases by 50% in the Home country only. On a separate page (that is, don't try to add this to the diagram of part (c)), but assuming the same initial free-trade equilibrium that you showed in part (c), use whatever tools you need to work out how this increase in productivity will affect the following. (Direction of change only.)
 - the world relative price of Food, and
 - the real wage of labor in the Foreign country.

2. [28 points] Consider a small-open, two-sector, Heckscher-Ohlin economy in which two factors, capital and labor, produce labor-intensive textiles and capital-intensive machines.
- [8 points] Use the Edgeworth Box and the production possibility frontier (PPF) to illustrate production, consumption, and the allocation of factors to the two industries in an initial equilibrium in which the country produces both goods, and in which it exports machines. Be sure to label these things so that I can tell that you know what they are.
 - [12 points] Use the Lerner Diagram to show the effects of a small increase in the world relative price of machines (small enough that it continues to diversify) on
 - Production of machines
 - The employment of both factors in the textile industry
 - The real wage of labor
 - [8 points] In what sense, if any, does this country benefit from the price change in part (b)? Who in the country does, and who does not, share in the benefit or loss?
3. [18 points] The figure on the next page (you may tear it off, if that will help you to look at it) shows three unit-value isoquants for industries 1, 2, and 3, corresponding to given prices p_1 , p_2 , and p_3 . Three straight lines are also drawn, each tangent to two of them at the black dots shown, and extending to the labor and capital axes where they intersect at the amounts L_1 , L_2 , L_3 , K_1 , K_2 , and K_3 . Through the points of tangency are also drawn straight lines from the origin, labeled k_1 , k_2 , etc., which refer to the capital-labor ratios that are their slopes. These lines divide the space into seven regions, for each of which a country has been drawn with factor endowments at another black dot labeled E^1 , etc.
- [10 points] Assume that these prices prevail initially in a world with free trade and identical constant-returns-to-scale technologies, so that all countries share the unit-value isoquants shown. Answer the following questions (no need to explain or show any work for this part):
 - Which country or countries produce good 1?
 - Which country or countries produce only one good?
 - What is the nominal wage of labor in country 3?
 - What is the nominal rental price of capital in country 4?
 - What is the capital-labor ratio employed in producing good 1 in country 3?
 - [8 points] Suppose now that the price of good 2 were to increase by a small amount, the other prices remaining unchanged. In your blue book, draw enough of the diagram to allow you to illustrate this change and determine the changes in output of good 2 in countries 1, 2, 3, and 4. Explain your answers.

