PROBLEM SET #2

1.   Consider a world economy that is identical to the one in question 1 on the first problem set. There are two countries and two produced goods. The production technologies in the two countries are different:

$$y_1^i = \ell_1^i / b_1^i, \quad i = 1, 2$$
$$y_2^i = \ell_2^i / b_2^i, \quad i = 1, 2.$$

In country 1, $b_1^1 = 1$ and $b_2^1 = 2$; in country 2, $b_1^2 = 2$ and $b_2^2 = 1$. In each country, the representative consumer has the utility function

$$\log c_1^i + \log c_2^i$$

and the endowment $\overline{\ell}^1 = \overline{\ell}^2 = 10$.

a)   What is the autarky equilibrium in each country? What is the free trade equilibrium for the world economy? Calculate the real income levels in each country in autarky and in free trade.

b)   Define a trade equilibrium with tariffs τ_2^1, τ_1^2.

Suppose now that country 1 imposes a 50 percent tariff on the imports of good 2 from country 2. The tariff revenues are redistributed in lump-sum form to the representative consumer in country 1. What is the equilibrium? Calculate the real income levels in each country. Suppose instead that country 2 imposes the tariff on the imports of good 1 from country 1 (but country 1 imposes no tariff. What is the equilibrium? Calculate the real income levels in each country.

c)   Suppose now that both countries impose 50 percent tariff on the imports. What is the equilibrium? Calculate the real income levels in each country.

d)   Use your answers to parts a, b, and c to set a 2×2 tariff war game. Explain the "prisoner's dilemma" nature of this game. Explain the role of free trade agreements in resolving the dilemma.

e)   Explain the concepts of countervailing duties and antidumping duties. How do your answers to parts a, b, c, and d relate to these trade policies? Find an example of a countervailing duty or antidumping duty imposed by the United States and explain the logic behind it. (Textbooks on international trade have such examples, but it would be fun to find a more recent example. Here is a website with some information: http://www.ita.doc.gov. There are other sources of information available.)

2.   Consider a world economy that is similar to the one in question 2 on the first problem set. There are two countries and two produced goods. The two factors of production are now high-skill labor, h, and low-skill labor, ℓ.

a)   Suppose that the production functions are equal across countries,

$$y_1^i = \min\left[h_1 / 3, \ell_1\right]$$
$$y_2^i = \min\left[h_2, \ell_2 / 3\right];$$

that the representative consumers' utility functions are equal,

$$u\left(c_1^i, c_2^i\right) = \log c_1^i + \log c_2^i ;$$

but that endowments are different, $\bar{h}^1 = 40$, $\bar{\ell}^1 = 32$ and $\bar{h}^2 = 32$, $\bar{\ell}^2 = 40$. Define an autarky equilibrium. What is the autarky equilibrium in each country? Define a free trade equilibrium. What is the free trade equilibrium for the world economy? Calculate the aggregate real income levels in each country in autarky and in free trade. Suppose that high-skill workers and low-skill workers are different people. Calculate their real income levels in autarky and free trade.

b)   Suppose that the two countries are initially closed to trade, but are considering opening. Using your answers to part a, tell a story about the debate over free trade in each country.

c)   Explain what you see to be the limitations of using models like that in part a to analyze gains and losses associated with changes in trade policy.