ECONOMICS 311: Intermediate Microeconomic Theory

ASSIGNMENT 10 (Last one!)

Answers to this assignment are due back by Friday, April 29, 2016.

1. **General equilibrium**
   a. The production possibilities frontier is given by $y^2 + 4x^2 = 900$. Graph the ppf. [Hint: Set this up in Excel, put $x$ in the first column with values of 1, 2, 3, etc., and $y$ in the next column, and graph using "scatterplot").
   b. Utility ($U$) is given by $U = x^{0.5}y$. Graph the indifference curves for $U = 54$ and $U = 72$.
   c. What output (i.e. feasible quantities of $x$ and $y$) give the maximum utility? [Either judge from the graph; or compute utility at different points of the ppf; or work it out algebraically).
   d. Now there is technical progress, and the new production possibilities frontier is given by the equation $y^{1.9} + 4x^2 = 900$. Show that in the new equilibrium, the quantity of $x$ produced and consumed will fall (compared to the situation in c.). [Hint: Graph the new ppf; and grant an indifference curve for $U = 85.8$.]

2. **Trade**
   a. A country has a ppf with the usual shape. The country exports some of good $X$ (oil) and imports some of good $Y$ (food). On a suitable diagram show this situation, with a ppf, trade line, and (social) indifference curve.
   b. Now introduce a tariff on imports. Show that this reduces social welfare. [Note: This is the mirror image of the diagram we developed in class, but it is not easy.]
   c. Explain in words why the tariff leaves the country worse off.
   d. Now go back to situation a. where there are no tariffs, but suppose that the country discovers more oil. Show and explain what will happen to trade and welfare.
   e. Does the situation in d. explain the "natural resource curse"? Justify your answer.

3. **Efficiency**
   a. What is meant by Pareto efficiency?
   b. Two individuals (A and B) have endowments of goods $X$ and $Y$. Specifically, A has 20 units of $X$ and 10 units of $Y$, while B has 50 units of $Y$ and 10 units of $X$. For A, the goods are complements; for B the goods are substitutes. Draw this situation in an Edgeworth Box, and show a plausible contract curve. Shade in the area in which the two individuals might potentially make mutually beneficial trades.