1.1 Consider an economy of two people who consume just two goods X and Y.

Person 1 has an endowment of $X_1 = 30$ and $Y_1 = 120$. Person 2 has an endowment of $X_2 = 180$ and $Y_2 = 90$. Their utility functions are, respectively:

$$U_1(X_1;Y_1) = X_1Y_1 U_2(X_2;Y_2) = X_2Y_2$$

- a) Graph the Edgeworth box corresponding to this economy.
- b) What are the equations for the indifference curves of persons 1 and 2 that go through the initial endowment? Plot the curves.
- c) Shade the locus of points that are Pareto-superior to the initial endowments.
- d) What is the equation of the contract curve in this economy? Graph it.
- e) Identify the boundaries of the points on the contract curve that are Paretosuperior to the initial endowments.
- f) Suppose a secretary of the market announces that all trading must take place at $P_X = \in 1$ and $P_Y = \in 2$. Furthermore, the secretary takes away each person's initial endowment and replaces it with its cash value. The secretary instructs each person to order the quantities of X and Y that maximize utility subject to the budget constraint.

(1) What quantities will persons 1 and 2 order?

(2) Can the secretary fill these orders with the endowments collected? Go through the same exercise with $P_X = \in 2$ and explain why the outcome is feasible and efficient.

- **1.2** Bert has initial endowment consisting of 10 units of food and 10 units of clothing. Ernie's initial endowment consists of 10 units of food and 20 units of clothing.
 - a) Represent these initial endowments in an Edgeworth box.
 - b) Bert regards food and clothing as perfect 1-for-1 substitutes. Ernie regards them as perfect complements, always wanting 3 units of clothing for every 2 units of food. Describe the set of allocations that are Pareto preferred to initial endowment.
 - c) Describe the contract curve for that allocation.
 - d) What price ratio will be required to sustain an allocation on the contract curve?
 - e) How will your answers differ if 5 units of Ernie's clothing endowment are given to Bert?