

Do **all 5** questions. All count equally

1. What are **all** the allocations on the contract curve for the following 2-person 2-good exchange economy?

Person 1's preferences can be represented by the utility function

$$u(x_1, y_1) = x_1 + 3 \ln y_1$$

where \ln is the natural logarithm function. (Recall that the derivative of $\ln z$ with respect to z is $1/z$.) Person 2's preferences can be represented by the utility function

$$U(x_2, y_2) = 12 \ln x_2 + y_2$$

The economy's total endowment of good X is 18, and the economy's total endowment of good Y is 18.

2. What is the competitive equilibrium allocation for the following 2-million-person, 2-good exchange economy?

There are 1 million people, each with the same preferences as person #1 in question 1, that is

$$u(x_1, y_1) = x_1 + 3 \ln y_1$$

Each of these type-1 people has an endowment of 18 units of good X , and no units of good Y .

There are also 1 million other people, each with the same preferences as person #2 in question #1, namely

$$U(x_2, y_2) = 12 \ln x_2 + y_2$$

Each of these type-2 people has an endowment of 0 units of good X , and 18 units of good Y .

3. What allocation would maximize the ("Benthamite") welfare function

$$W(u_1, u_2) = u(x_1, y_1) + U(x_2, y_2)$$

for the economy described in question #2?

over

4. What is the incidence of a tax of \$1 per video rental in a perfectly competitive market for video rentals, if the supply curve in the market has the equation

$$Q^s = 12p_s - 6$$

and the demand curve has the equation

$$Q^D = 72 - 6P^D$$

where p_s is the price received by sellers, P^D is the price paid by buyers, Q^s is the quantity supplied, and Q^D is the quantity demanded?

5. What is the incidence of a 44% tax on coffee, if the market for coffee is perfectly competitive, if the supply curve for coffee has the equation

$$Q^s = p_s$$

and the demand curve for coffee has the equation

$$Q^D = \frac{576}{P^D}$$

where p_s is the price received by sellers, P^D is the price paid by buyers, Q^s is the quantity supplied and Q^D is the quantity demanded? (Here the ad valorem tax rate is expressed as a percentage of the before-tax price.)