ECNS 204 – Microeconomics
Eric J. Belasco
Homework 1
Due Thursday, January 17

----

1. Explain why the following statement is true or false.

    "If Americans can produce both agricultural and industrial products with less effort and fewer raw materials than Mexicans can, then there can be no advantage to the United States trading with Mexico."

    False. The gains from trade arise from comparative advantages, not absolute advantages. While the US has an absolute advantage in agricultural and industrial production, it may not have a comparative advantage in both.

    [2 points for a complete answer]

2. Assume that in an effort to welcome back customers after being closed for a few months, Sola Café offers any customer a lunch free of charge on Tuesday afternoon. One might assume there to be a long waiting time (at least an hour) for such a lunch deal. Are you more likely to find a high income earner or low income earner waiting in line? Explain.

    The opportunity cost to waiting in line is the foregone wages or value of production. Low income earners have a lower opportunity cost of waiting in line and are more likely to be waiting in line for the Sola deal.

    [2 points for a complete answer]

3. Suppose an acre of land in Iowa can yield either 50 bushels of wheat or 100 bushels of corn, while an acre of land in Oklahoma can yield either 20 bushels of wheat or 30 bushels corn.
    a. What is the cost of growing 200 bushels of wheat in Iowa? What is the cost of growing 200 bushels of wheat in Oklahoma?

        In Iowa, 4 acres [= 200 bushels/50 bushels per acre] are needed to produce 200 bushels of wheat. If 4 acres were devoted to growing corn, 400 bushels of corn [= 4 acres *100 bushels per acre] would be produced. Therefore <u>the cost of 200 bushels in Iowa is 400 bushels of corn</u>.

        In Oklahoma, 10 acres [=200 bushels/20 bushels per acre] are needed to produce 200

bushels of wheat. If 10 acres were devoted to growing corn, 300 bushels of corn [= 10 acres * 30 bushels per acre] would be produced. Therefore <u>the cost in Oklahoma is 300 bushels of corn.</u>

[3 points]

b. Which state has a comparative advantage in growing wheat?

In Iowa, each bushel of wheat costs 2 bushels of corn [= 400/200]. In Oklahoma, each bushel of what costs 1.5 bushels of corn [=300/200]. Therefore, <u>Oklahoma</u> has a comparative advantage in wheat.

[2 points]

c. Which state has a comparative advantage in growing corn?

<u>Iowa</u> has a comparative advantage in corn. [cost is 0.5 in Iowa and 0.667 in Oklahoma]

[1 point]

d. Suppose the residents of both Iowa and Oklahoma prefer to eat 200 bushels of wheat and 360 bushels of corn. If there is no trade, how many acres must producers in each state devote to corn and wheat production?

In Iowa, 4 acres [=200 bushels/50 bushels per acre] for wheat and 3.6 acres [=360 bushels/100 bushels per acre].
In Oklahoma, 10 acres [=200 bushels/20bushels per acre] for wheat and 12 acres [=360 bushels/30 bushels per acre]

[2 points]

e. Suppose that Iowa and Oklahoma begin trading and focus their production exclusively on the commodity for which they have a comparative advantage *(Hint: Total output must equal 400 bushels of wheat and 720 bushels of corn)*.
    i. How many acres in Iowa are freed up for other uses?

        Iowa utilizes 7.2 acres [=720 bushels of corn/100 bushels per acre] which is <u>0.4 acres less</u> [= 7.2 acres - (4 acres + 3.6 acres)]

        [1 point]

ii. How many acres in Oklahoma are freed up for other uses?

Oklahoma utilizes 20 acres [= 400 bushels of wheat/20 bushels per acre] which is 2.0 acres less [= 20 acres – (10 acres + 12 acres)]

[1 point]

4. Suppose the demand curve for oranges is given by the equation
$$Q = -200 * P + 1,000$$
with quantity (Q) measured in oranges per day and price (P) measured in dollars per orange.
   a. What is the slope of the demand curve? Is it positive or negative? Does this conform to the Law of Demand?

   The slope can be obtained by plugging in a couple of numbers for P. For example, when P = (0,1) the corresponding Q = (1,000; 800). This implies a slope of -200. This is a negative slope and corresponds with the Law of Demand, which states that prices are inversely related to quantity demanded (e.g., as the price of a good increase, quantity demanded will decrease.)

   [3 points]

   b. Suppose the supply curve is as follows
$$Q = 800 * P$$
Compute the equilibrium price and quantity of oranges.

   First, rearrange the supply equation such that $P = Q/800$.
   Second, plug this into the demand equation, $Q = -200 * (Q/800) + 1,000$
   Third, solve for Q
$$Q = -\frac{200 * Q}{800} + 1,000$$
$$Q = -\frac{Q}{4} + 1,000$$
$$Q - 1,000 = -\frac{Q}{4}$$
$$4 * (Q - 1,000) = 4 * -\frac{Q}{4}$$
$$4Q - 4,000 = -Q$$
$$5Q = 4,000$$
$$Q^* = \frac{4,000}{5} = 800$$
   Fourth, plug Q^* to find P^*
$$P^* = \frac{Q^*}{800} = \frac{800}{800} = 1.0$$

c. Plot the supply and demand curves with appropriately labeled axis. Identify equilibrium P and Q on your plot.

[4 points]

Price (P)

5.0

Supply curve

P* = 1.0

Demand Curve

Q* = 800   1,000   Quantity (Q)