

## Homework #2

problems #3 and 8 from Ch. 2, p. 41–42 of Case/Fair *Principles...* (6th ed.)  
and a few of my own problems

3. Kristin and Anna live in the beach town of Santa Monica. They own a small business in which they make wristbands and potholders and sell them to people on the beach. Kristen can make 15 wristbands per hour, but only 3 potholders. Anna is a bit slower and can make only 12 wristbands or 2 potholders in an hour.

	<u>output per hour</u>	
	Kristin	Anna
Wristbands	15	12
Potholders	3	2

- a. For Kristin and for Anna what is the opportunity cost of a potholder? Who has a comparative advantage in the production of potholders? Explain.
- b. Who has a comparative advantage in the production of wristbands? Explain.
- c. Assume that Kristin works 20 hours per week in the business. If Kristin were in business on her own, graph the possible combinations of potholders to wristbands that she could produce in a week. Do the same for Anna.
- d. If Kristin devoted half of her time (10 out of 20 hours) to wristbands and half of her time to potholders, how many of each would she produce in a week? If Anna did the same, how many of each would she produce? How many wristbands and potholders would be produced in total?
- e. Suppose that Anna spent all 20 hours of her time on wristbands and Kristin spent 17 hours on potholders and 3 hours on wristbands. How many of each would be produced?
- f. Suppose that Kristin and Anna can sell all their wristbands for \$1 each and all their potholders for \$5.50 each. If each of them worked 20 hours per week, how should they split their time between wristbands and potholders? What is their maximum joint revenue.

**Do this too!** Think about problem 3.f. using different relative prices, i.e. How should Kristin and Anna optimally allocate their time if the price of potholders was \$4? if it was \$5.50? and if it was \$7? What is their maximum joint revenue in each case?

**Do this too!** Suppose that the simple society of Greenville can produce rice and beans. Suppose also that the Greenville's production possibilities frontier is given by the equation:

$$\text{PPF: rice} = 18 - \frac{1}{2} \text{beans}^2$$

- a. Placing beans on the horizontal axis and rice on the vertical axis, graph Greenville's PPF.
- b. Suppose the relative price of beans is:  $2 \frac{\text{rice}}{\text{beans}}$ . Using the Calculus Tricks you learned in the first lecture, find the quantities of rice and beans that Greenville should produce at that relative price.
- c. Now suppose the relative price of beans rises to:  $4 \frac{\text{rice}}{\text{beans}}$ . Should Greenville produce more or less rice? Should Greenville produce more or less beans? What quantities of rice and beans should Greenville produce at that relative price?
- d. At what relative price of beans should Greenville specialize in the production of beans and produce no rice at all?

8. A nation with fixed quantities of resources is able to produce any of the following combinations of bread and ovens:

<u>loaves of bread (millions)</u>	<u>ovens (thousands)</u>
75	0
60	12
45	22
30	30
15	36
0	40

These figures assume that a certain number of previously produced ovens are available in the current period for baking bread.

- Using the data in the table, graph the ppf (with ovens on the vertical axis).
- Does the principle of "increasing opportunity cost" hold in this nation? Explain briefly. (*Hint*: What happens to the opportunity cost of bread -- measured in number of ovens -- as bread production increases?)
- If this country chooses to produce both ovens and bread, what will happen to the ppf over time? Why? Now suppose that a new technology is discovered that allows twice as many loaves to be baked in each existing oven.
- Illustrate (on your original graph) the effect of this new technology on the production possibilities curve.
- Suppose that before the new technology is introduced, the nation produces 22 ovens. After the new technology is introduced, the nation produces 30 ovens. What is the effect of the new technology on the production of bread? (Give the number of loaves before and after the change).

**Do this too!** In the story of Colleen and Bill on p. 28–29 of *Case/Fair Principles...*, there's an **error**. The book says Bill and Colleen produce logs and bushels of food at the following rates:

	<u>Production per day</u>	
	Colleen	Bill
food (bushels)	10	8
fuel (logs)	10	5

The book also says that Bill and Colleen value bushels of food and logs equally, so that the price of one bushel equals the price of one log.

- Despite what is written,
  - Bill gains from trade with Colleen, but
  - Colleen doesn't gain from trade with Bill.
  - However, she doesn't lose by trading with Bill.
- Why doesn't Colleen gain from trade?
- Leaving opportunity costs unchanged, how can the story be rewritten, so that both Bill and Colleen gain from trade?

Hint: How does the assumption that Bill and Colleen value bushels of food and logs equally prevent Colleen from gaining from trade (given the production rates given above)?