Solutions to Practice Problems #1

The problems below draw from the material in Chapters 1-3 and related lectures. I recommend that you answer these problems as we go through the material or shortly thereafter. Solutions to these problems are at the course website. The most productive approach is to write out all the answers, neatly on a separate sheet of paper, and then check the solutions.

1. Determine which category of resources each of the following belongs in:

   a. a train (capital)
   b. computer software (capital)
   c. one hour of psychological counseling (labor)
   d. a parking lot (capital)
   e. a forest (land/natural resource)
   f. Lake Michigan (land/natural resource)
   g. a prison (capital)

2. The IDS is a free good. True/false/explain.
   The IDS is not free, neither to produce nor consume. Resources (land, labor, and capital) are diverted from other potential uses to produce the IDS. Other consumption activities are sacrificed to read the IDS (you could be reading something else, say, the Wall Street Journal instead). Shocking though it may seem, I have even noticed some people reading the IDS in class, sacrificing their attention to the lecture and perhaps distracting other students around them! Finally, the IDS is probably the second biggest item (after cigarette butts) polluting our beautiful campus, especially in classrooms. (We take up that issue in Chap 10.)

3. What is the opportunity cost of purchasing a $500 stereo system? Of producing a $500 stereo?
   The purchase of the stereo costs $500 of other consumption. More precisely, the next-best use of the $500 is given up, perhaps the purchase of a computer. The productive resources could have been employed to produce some other good, for example, a computer.

4. a. What do you sacrifice to attend your E201 class on a given day? (List all relevant alternatives.)
   Various answers: sleep, leisure activities, exercising, earning income, etc.
   b. What is the opportunity cost of attending E201 on a given day? Explain.
   The next-highest valued use of your time.

5. You win a full scholarship to graduate school in advanced enigmatology, but expect to reap little benefit from this study. Nonetheless, you decide to go because it's free. What's wrong with this thinking?
   There are other things you could do with the time and labor you will spend in graduate school such as earning money at a job. There is a cost associated with going to graduate school.

6. a. What does it cost you to attend a concert if the ticket price is $60?
   $60 of other consumption plus an alternative use of the time involved in attending.
   b. What happens to the cost if the same concert is held the night before your E201 exam?
   It likely increases.

7. a. Positive.
   b. Normative—seems to me that a policy is implicitly advocated in this statement, so it's not a testable statement. The level of poverty can be easily changed by changing the definition of poverty.
c. Normative—involves a value judgment about poverty.
d. Normative—says what the Fed should do.
e. Normative—says what a policy ought to be.
f. Normative—says what a policy ought to be.
g. Normative—requires a value judgment to prescribe what behavior ought to be.
h. Positive—testable proposition.

8. A reduction in the unemployment rate will shift the PPF of an economy outward. True or false. Explain with a graph.
False. This moves us closer to the PPF, from an inefficient point such as A to a more efficient point (B). Recall that points on the PPF make full use of existing resources, so we are at full employment when we are on the frontier. (Note. “Full employment” is not the same as a zero-unemployment rate. But that’s a topic for macroeconomics, E202.)

9. Suppose a small economy produces two goods, cars and boats, as follows:

<table>
<thead>
<tr>
<th>Cars</th>
<th>Boats</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>1000</td>
</tr>
<tr>
<td>100</td>
<td>600</td>
</tr>
<tr>
<td>200</td>
<td>0</td>
</tr>
</tbody>
</table>

a. What is the cost of the first 100 cars? (400 Boats)
b. What is the cost per car of the first 100 cars? (4 Boats)
c. What is the cost of the second 100 cars? (600 Boats)
d. What is the cost per car of the second 100 cars? (6 Boats)
e. What do your answers tell you about opportunity costs in production? (They are increasing.)
f. Sketch the PPF for this economy.

10. There is a debate about whether disposable diapers make efficient use of scarce resources. On the one hand, it is argued that disposable diapers resist biodegradation, creating problems in land fills. What valuable resource is omitted from this debate--but not from Chapter 1--that makes disposables the most efficient choice for most diaper changers?
The time it would take for people to clean diapers is omitted. There are other things people could do instead of cleaning diapers. Opportunity cost of time (perhaps our most precious resource) is often ignored in policy debates.

11. Suppose that you win $100 in a football pool. You have a choice: spend the money now or put it in a bank account that pays 5 percent interest. What is the opportunity cost of spending the $100 now? What is the opportunity cost of putting the $100 in the bank? Which choice is better? The opportunity cost of spending the $100 now is the interest ($5) you could earn if you chose to save this money. The opportunity cost of putting the money in the bank is the satisfaction you would receive from spending the money presently. The better choice depends on your own preferences--that is, it requires a value judgment.

12. The Social Security system provides income transfer payments for people over age 66, provided they have worked and paid Social Security tax at least 10 quarters during their lives.

a. How does the provision of Social Security affect a person's incentive to save during their work years?

Soc Sec reduces saving. Suppose I know that my retirement income from Social Security will be $1000 a month ($12,000 per year). Those earnings are the equivalent of owning a $240,000 bond portfolio (at an interest rate of 5%). So, under a Social Security system, I can decrease my personal saving by about a quarter of a million dollars during my working years and be no worse off during my retirement. Soc Sec distorts the choice between saving and consuming.

b. Social Security recipients age 66 and over who earn more than $38,000 a year from work have their SS benefits reduced by $1 for every $3 of income. What is the effect of this policy on work incentives for persons over 66?

The benefit reduction rate is an effective 33% marginal tax rate, so the after-tax wage is actually one-third lower. A lower wage reduces the opportunity cost to take leisure, so there is more leisure consumed and fewer hours worked. (This answer is only part of the story about the effect of taxes on work incentives. More later.)

13. In response to the 9/11 terrorist attacks in the U.S., more resources have been allocated to security, especially at airports.

a. Show the effects of this change on the US production possibilities frontier. (Hint: Use AOG (all other goods) on one axis and security on the other axis.)

b. Assume that terrorists have certain demographic characteristics. Further assume that security personnel are not allowed to use information about likely terrorists in trying to catch terrorists. What does this policy do to the PPF of the U.S.?

Since we are not making full use of existing resources and technology in the production of security and AOG, we would move to a point interior of the PPF.

14. It is sometimes said that terrorist groups have an endless stock of willing “members” (suicide bombers and the like). Do terrorist groups face resource constraints?

a. Draw the PPF of a terrorist group. (Hint: use AOG on one axis; you have to think like a terrorist to label the other axis.)

Terrorists view the destruction of their enemies’ property and (especially) their lives as a good, so something like “kills” on one axis would be appropriate. (If this is uncomfortable or offensive for you to think about, here is something else to consider: terrorists want their foes to be afraid of them; squeamishness is likely to be viewed as a sign of weakness by a ruthless enemy, emboldening them.)

b. Show the effect of a successful military operation against a terrorist group on the terrorists’ PPF.

The PPF shifts inward as a result of the destruction of terrorists’ resources, resulting in lower production possibilities of terrorist strikes and terrorist AOG.
15. In one hour Walt can either write one poem or mow two lawns, and Edna can either write two poems or mow three lawns.

a. Who has the absolute advantage in writing poems?
   In mowing?
   Edna has the absolute advantage in both poems and lawns.

b. Find the opportunity cost of writing 1 poem for each individual.
   Opportunity cost of 1 poem for Edna is 1 ½ lawns.
   For Walt, 1 poem costs 2 lawns.

c. Find the opportunity cost of mowing 1 lawn for each individual.
   Opportunity cost of 1 lawn for Edna is 2/3 poem.
   For Walt, 1 lawn costs ½ poem.

d. Who has the comparative advantage in writing poetry?
   In mowing lawns?
   Edna has the comparative advantage in poems, since she gives up less in lawns to write poems.
   Walt has the comparative advantage in lawns, since he gives up fewer poems to mow lawns.

e. If each individual specializes and trades with the other, what would be a potential exchange rate?
   (Hint: both individuals must be better off with trade than without trade.)
   The terms of trade would be 1 poem for something between 3/2 and 2 lawns. For example, 1 poem for 7/4 lawns is mutually beneficial.