**AP Krugman Section 1 Problem Solutions**

**1.** The four categories of resources are land, labor, capital, and entrepreneurship. Possible examples of resources include the property where the factory is located (land), factory workers (labor), sewing machines (capital), and the design of the assembly line (entrepreneurship).

**2. a.** One of the opportunity costs of going to college is not being able to take a job. By choosing to go to college, you give up the income you would have earned on the job and the valuable on-the-job experience you would have acquired. Another opportunity cost of going to college is the cost of tuition, books, supplies, and so on. On the other hand, the benefit of going to college is being able to find a better, more highly paid job after graduation in addition to the joy of learning.

**b.** Watching the movie gives you a certain benefit, but allocating your time (a scarce resource) to watching the movie also involves the opportunity cost of not being able to study for the exam. As a result, you will likely get a lower grade on the exam—and all that that implies.

**c.** Riding the bus gets you where you need to go more cheaply than, but probably not as conveniently as, driving your car. That is, some of the opportunity costs of taking the bus involve waiting for the bus, having to walk from the bus stop to where you need to go rather than parking right outside the building, and probably a slower journey. If the opportunity cost of your time is high (your time is valuable), these costs may be prohibitive.

**3. a.** The worse the job market, the lower the opportunity cost of getting a graduate degree. One of the opportunity costs of going to graduate school is not being able to work. But if the job

market is bad, the salary you can expect to earn is low or you might be unemployed—so the opportunity cost of going to school is also low.

**b.** When the economy is slow, the opportunity cost of people's time is also lower: the wages they could earn by working longer hours are lower than when the economy is booming. As a result, the opportunity cost of spending time doing your own repairs is lower—so more people will decide to do their own repairs.

**c.** The opportunity cost of parkland is lower in suburban areas. The price per square foot of land is much higher in urban than in suburban areas. By creating parkland, you therefore give up the opportunity to make much more money in cities than in the suburbs.

**d.** The opportunity cost of time is higher for busy people. Driving long distances to supermarkets takes time that could be spent doing other things. Therefore, busy people are more likely to use a nearby convenience store.


**4. a.** The positive statements are: workers in Asia . . . [are] earning only pennies an hour

■ American workers are more productive

■ American workers are more productive and, as a result, earn higher wages

The normative statement is:

■ the government should enact legislation banning imports of low-wage Asian clothing

**b.** It is not. The statement about the productivity of American and Asian workers is about the absolute advantage that American workers have over Asian workers.

However, Asian workers may still have a comparative advantage. And if that is the case, then banning imports would result in inefficiency.

**c.** If America channeled more of its productive resources into producing clothing, it would have to give up producing other goods. As a result, America would be able to consume less of all goods. And this would make some Americans clearly worse off. Therefore, this policy would not be efficient.

**d.** Low-wage Asian workers would also be hurt by this policy. The Asian country would channel its resources away from producing clothing toward producing other goods that it previously imported from America. But since it does not have the comparative advantage in those other goods, the Asian country would be able to consume less of all goods.


**5. a.** True. This is a positive statement. It has a factual answer; that is, it is either right or wrong. There has been some debate about whether the statement is actually true or false, but in principle there is only one answer.

**b.** False. This is a statement about what we should do, and this statement has no clearly right or wrong answer. Your view will depend on whether you think encouraging more work is a good or a bad idea.

**c.** True. Economics is best at giving positive answers, for instance, answers about what the most efficient way is of achieving a certain aim. The question of how society ought to be organized is mostly decided in the realm of politics.

**d.** False. This is a positive statement. In principle, it has an answer that is either right or wrong.

**e.** False. Some disagreements among economists arise from the fact that in building a model, one economist thinks that a certain abstraction from reality is admissible but another economist may think that that abstraction is not admissible. Some disagreements arise from the fact that economists sometimes disagree about values.

**6.** A business-cycle expansion is a period of recovery after a recession, and lasts until the next economic downturn. An expansion can occur regardless of any increase in the economy's long-term potential for production. Economic growth increases the economy's ability to produce more goods and services over the long term, and can last for several decades.

**7.** True. With hindsight it is easier to see the important features of the situation that a model should have captured. For predictive purposes, a model needs to anticipate which features of reality are important (and so should be included) and which are unimportant (and so can be ignored). This is why the famed British economist John Maynard Keynes referred to economics as an art as well as a science.

**8. a.** The accompanying diagram shows the production possibilities curve for Atlantis.
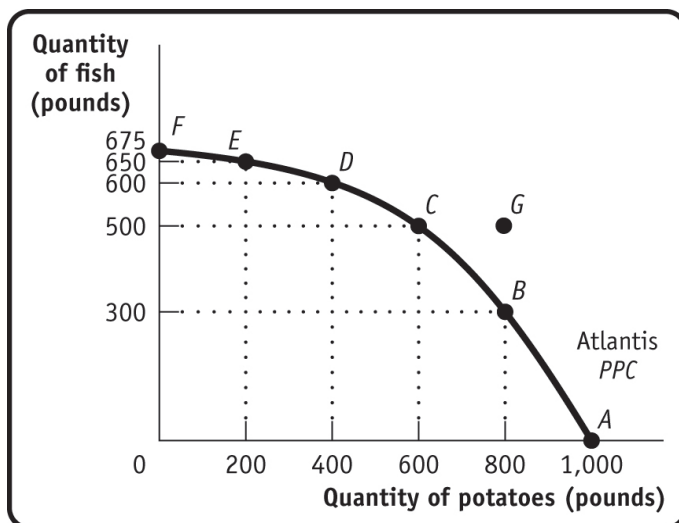


**b.** No, Atlantis cannot produce 500 pounds of fish and 800 pounds of potatoes. If it produces 500 pounds of fish, the most potatoes it can produce is 600 pounds.

This point would lie outside the production possibilities curve, at point G on the diagram.

**c.** The opportunity cost of increasing output from 600 to 800 pounds of potatoes is 200 pounds of fish. If Atlantis increases output from 600 to 800 pounds of potatoes, it has to cut fish production from 500 pounds to 300 pounds, that is, by 200 pounds.

**d.** The opportunity cost of increasing output from 200 to 400 pounds of potatoes is 50 pounds of fish. If Atlantis increases output from 200 to 400 pounds of potatoes, it has to cut fish production from 650 pounds to 600 pounds, that is, by 50 pounds.

**e.** The answers to parts c and d imply that the more potatoes Atlantis produces, the higher the opportunity cost becomes. For instance, as you grow more and more potatoes, you have to use less and less suitable land to do so. As a result, you have to divert increasingly more resources away from fishing as you grow more potatoes, meaning that you can produce increasingly less fish. This implies, of course, that the production possibilities curve becomes steeper the farther you move along it to the right; that is, the production possibilities curve is bowed out. (Mathematicians call this shape concave.)

**9. a.** Forgoing the production of 1 metric ton of fish allows Bermuda to produce 2,000 additional hotel stays. Therefore, forgoing the production of 286 metric tons of fish allows Bermuda to produce $2,000 \times 286 = 572,000$ additional hotel stays. If all fishermen worked in the hotel industry, Bermuda could produce $538,000 + 572,000 = 1,110,000$ hotel stays.

**b.** Forgoing the production of 2,000 hotel stays allows Bermuda to produce 1 additional metric ton of fish, so giving up 538,000 hotel stays allows Bermuda to produce $538,000/2,000 = 269$ additional metric tons of fish. If all hotel employees worked in the fishing industry, Bermuda could produce $286 + 269 = 555$ metric tons of fish.

**c.** The accompanying diagram shows the production possibilities curve for Bermuda. Note that it is a straight line because the opportunity cost is constant. Point A is Bermuda's actual production point.
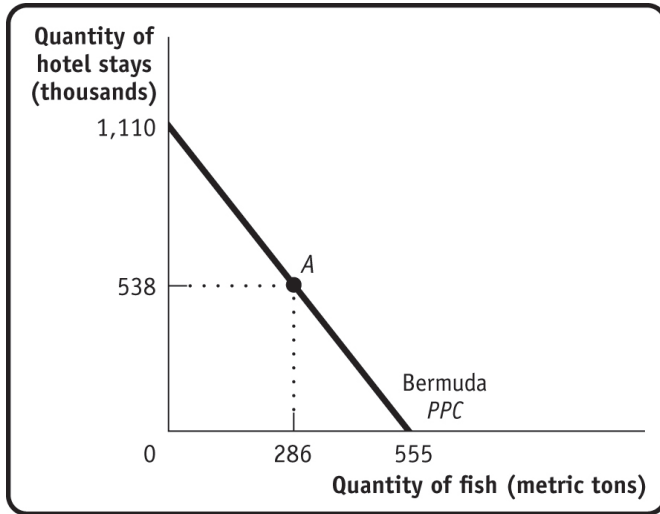


**10. a.** The accompanying diagram shows the production possibilities curve for the Tivoli in panel (a) and for the Frivoli as the line labeled "Original Frivoli PPC" in panel (b).
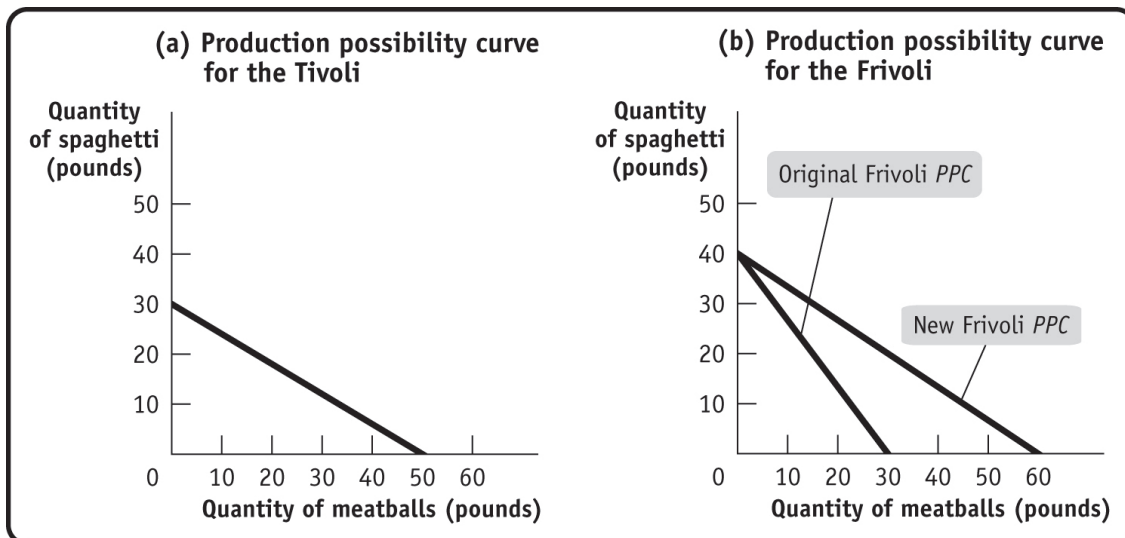
The production possibilities curve for the Tivoli was calculated as follows: the Tivoli can produce either 30 pounds of spaghetti and no meatballs, or they can produce no spaghetti but 50 pounds of meatballs. That is, the opportunity cost of 1 pound of meatballs is $3/5$ of a pound of spaghetti: in order to produce 1 more pound of meatballs, the Tivoli have to give up $3/5$ of a pound of spaghetti. This means that the slope of their production possibilities curve is $-3/5$. A similar argument for the Frivoli shows that their production possibilities curve has a slope of $-4/3$.

**b.** For the Tivoli, the opportunity cost of 1 pound of spaghetti is $5/3$ pounds of meatballs. For the Frivoli, the opportunity cost of 1 pound of spaghetti is $3/4$ pound of meatballs. That is, the Frivoli have a comparative advantage in spaghetti production because their opportunity cost is lower. For the Tivoli, the opportunity cost of 1 pound of meatballs is $3/5$ of a pound of spaghetti. For the Frivoli, the opportunity cost of 1 pound of meatballs is $4/3$ pounds of spaghetti. That is, the Tivoli have a comparative advantage in meatball production because their opportunity cost is lower.

**c.** The Frivoli's new production possibilities curve is the line labeled "New Frivoli PPC" in panel (b) of the diagram. Instead of producing 30 pounds of meatballs (if they produce no spaghetti), they can now produce 60 pounds.

**d.** Now the Frivoli have the absolute advantage in both meatball production and spaghetti production. The Frivoli's opportunity cost of meatballs has now fallen to $4/6 = 2/3$; that is, for each pound of meatballs that the Frivoli now produce, they have to give up producing $2/3$ of a pound of spaghetti. Since the Frivoli's opportunity cost of meatballs ($2/3$) is still higher than the Tivoli's ($3/5$), the Tivoli still have the comparative advantage in meatball production. The

Frivoli's opportunity cost of spaghetti is 3⁄2 pounds of meatballs and the Tivoli's is 5⁄3 pounds of meatballs, so the Frivoli have the comparative advantage in spaghetti production.

**11. a.** This point is feasible but not efficient in production. Producing 1.8 billion bushels of wheat and 9 billion bushels of corn is less of both wheat and corn than is possible. They could produce more if all the available farmland were cultivated.

**b.** At this new production point, farmers would now produce 1 billion more bushels of wheat and 1.7 billion fewer bushels of corn than at their original production point. This reflects an opportunity cost of 1.7 bushels of corn per additional bushel of wheat. But, in fact, this new production point is not feasible because we know that opportunity costs are increasing. Starting from the original production point, the opportunity cost of producing one more bushel of wheat must be higher than 1.7 bushels of corn.

**c.** This new production point is feasible and efficient in production. Along the production possibilities curve, the economy must forgo 0.666 bushels of wheat per additional bushel of corn. So the increase in corn production from 11.807 billion bushels to 12.044 billion bushels costs the economy (12.044 −11.807) billion bushels of corn × 0.666 bushel of wheat per bushel of corn = 0.158 bushel of wheat. This is exactly equal to the actual loss in wheat output: the fall from 2.158 billion to 2 billion bushels of wheat

**12. a.** Gains from trade usually arise from specialization. If the Hatfields (compared to the McCoys) are better at raising chickens and the McCoys (compared to the Hatfields) are better at growing corn, then there will be gains from specialization and trade.

**b.** Similar to the answer to part a, if the McCoys (compared to the Hatfields) are better at raising chickens and the Hatfields (compared to the McCoys) are better at growing corn, then there will be gains from specialization and trade.

**13. a.** Since countries gain from specializing in production of the goods and services in which they have a comparative advantage, the United States must have the comparative advantage in aircraft production, and China must have the comparative advantage in production of trousers, slacks, and jeans.

**b.** Since trade has nothing to do with absolute advantage, we cannot determine from this data which country has an absolute advantage in either of these goods.

**14. a.** Peter Pundit is not correct. He confuses absolute and comparative advantage. Even if the EU had an absolute advantage over the United States in every product it produced, the United States would still have a comparative advantage in some products. And the United States should continue to produce those products: trade will make both the EU and the United States better off.

**b**. You should expect to see the EU export those goods in which it has the comparative advantage and the United States export those goods in which it has the comparative advantage.