Production Possibilities Curve Name _____KEY_____

1. **FIGURE 1 PPC** shows the production possibilities curve for the economy of Alpha, which makes weapons of mass destruction and food.

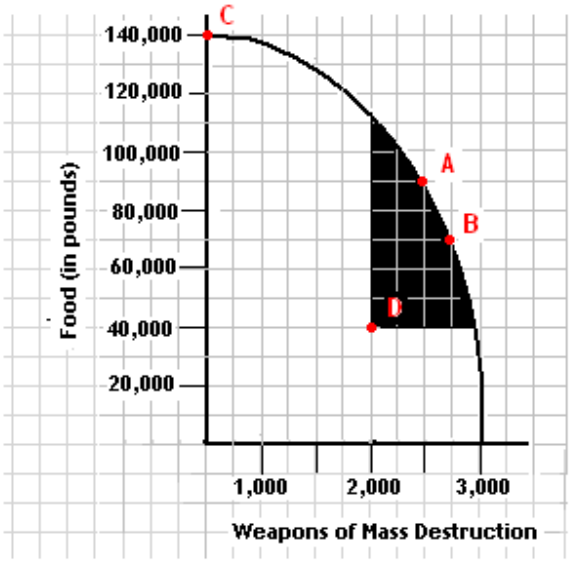


FIGURE 1 PPC

a. If all resources are devoted to the production of food, Alpha can produce __**140,000**___ pounds of food. In order to produce 1,500 WMD, the opportunity cost in terms of food is ___**10,000**___ pounds. To produce another 1,000 WMD, the opportunity cost (**rises**/falls) to __**40,000**_____ pounds. As long as the PPF continues to curve outward and downward, the opportunity cost of increased WMD output will **(continue to rise**/start to fall). Food doesn't easily convert into weapons of mass destruction so more resources must be used as more weapons are produced. If the resources were perfectly substitutable, how would you draw the PPF? (HINT: if your MP3 player could only hold 100 songs and currently held 100 songs, how many songs would you have to give up to get one more?) **The PPF would be a straight line with equal Y and X. i.e. 30 Food and 30 WMD.**

b. Find the combination of 2,500 WMD and 90,000 pounds of Food on Figure 1. Label this point A. Is it an attainable combination for Alpha? __**Yes**___ Find the combination of 2,750 WMD and 70,000 pounds of Food. Label this point B. Is it attainable? ___**Yes**__ Find specialization point, 0 WMD and 140,000 pounds of Food and label it point C. Is this point attainable? __**Yes**__ We conclude that attainable combination points are (**on**/inside/outside) the production possibilities curve.

c. A point inside of the production possibilities curve is inefficient because it is possible to produce more of one or both goods without opportunity cost. Find the combination of 2,000 WMD and 40,000 pounds of Food. Label this point D. Show that it is inefficient by shading all of the attainable combinations that show that more of one or both goods can be attained.

d. Suppose the government of Alpha wanted to move from 70,000 pounds of Food and 2,750 WMD to 0 pounds of Food and 3,000 WMD. Calculate the opportunity cost in terms of pounds of Food. __**70,000**___ Is specialization point 0 pounds of Food and 3,000 WMD desirable? __**Probably Not**___ What point is best for Alpha? **(Answers will vary.)**

2. ADVANCED ANALYSIS. Omega is a small tropical island that produces pearls (P) and fish (F). Omega's production possibilities curve is given by:

$P = 2L^{.5}K^{.5} - .3F^2$

Where L is the size of the labor force (400 people) and K is the number of capital goods which is 100.

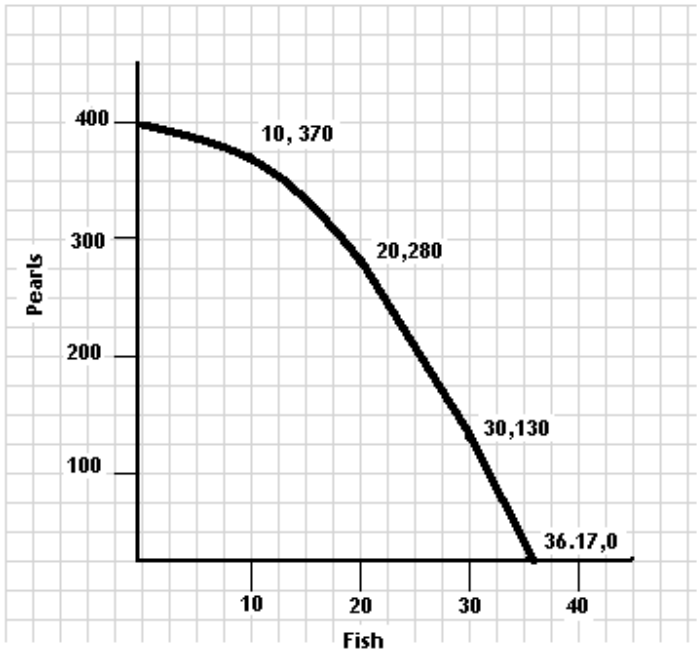
a. What is the maximum number of fish that can be produced? **36.51** Call this number F*. What is the maximum number of pearls that can be produced? **400** Call this number P*.

b. Calculate pearl production for points for theses combinations. F = 10, 20, 30, 36. Graph the PPC for Omega. Label the X-axis, Fish; label the Y-axis, Pearls.

c. Is this PPC consistent with increasing costs? **Yes**.

d. Is the output combination 1/2F*, 1/2P* attainable? **Yes** Is this point efficient? **No**. Why or why not? **Inside the PPC**.

e. What is the opportunity cost of more fish when 10 fish are produced? 20 fish? 30 fish? **30, 90, 150**



Author's comments. This problem uses the aggregate production function ($2L^{.5}K^{.5}$) to show the maximum amount Omega could produce. Because the exponents sum to 1, the function has constant returns to scale. The production function also exhibits diminishing returns.

