Name: _____Solutions___

Cosumnes River College
Principles of Macroeconomics
Problem Set 1
Due January 30, 2017

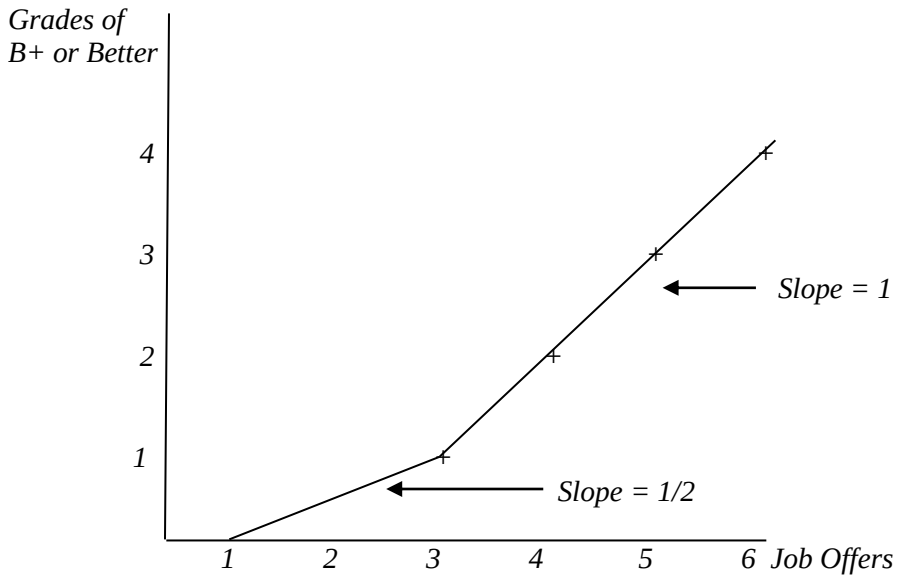
Spring 2017 Prof. Dowell

Instructions: Write the answers clearly and concisely on these sheets in the spaces provided. Do not attach extra sheets.

1. Colin believes the number of job offers he will get depends on the number of courses in which his grade is a B+ or better. He concludes from observation that the following figures are typical:

Number of grades B+ or better	0	1	2	3	4
Number of job offers	1	3	4	5	6

   a. Represent this data in a graph with the dependent variable on the horizontal axis. Be sure to clearly label your diagram.



   b. Calculate the slope between points on the line. (You will have two distinct segments with different slopes.) Interpret the slopes. What do they mean?

   Note the reversal of the dependent and independent variables. This is exactly what we do with supply and demand curves where we place quantity, the dependent variable, on the horizontal axis. As a result of this reversal, we must consider the inverse of the slope rather than the slope itself. Doing this, we see that along the first segment of the line, an increase of 1 (from 0 to 1) in the number of B+ or greater grades leads to an increase of 2 in the number of job offers. Along the second segment, an increase in the number of grades of B+ or better of 1 leads to an increase in the number of job offers of 1.

2. Solve the following for the unknown variable(s):

a. $7t-5=4t+7$

$$3t=12$$
$$t=4$$

b. $5x+2+3x=7x-7-2x+5$

$$8x+2=5x-2$$
$$3x=-4$$
$$x=-4/3$$

c.
$$x+y=8$$
$$x-y=2$$

Solve each for x and set equal to each other to solve for y. Sub y back in to solve for x.

$$x=8-y \qquad x=2+y$$

$$8-y=2+y$$
$$6=2y$$
$$y=3$$

$$x=8-3=5 \qquad x=2+3=5$$

$X = 5$ and $y = 3$

c.
$$x+2y=1$$
$$6x-2y=34$$

$$2y=1-x \Rightarrow y=1/2-1/2\,x$$
$$2y-34-6x \Rightarrow -34/2-6/2\,x$$

$$1/2-1/2\,x=-34/2-6/2\,x \Rightarrow 5/2\,x=-35/2 \Rightarrow x=-7$$

$$y=1/2-1/2(-7)=8 \quad \text{and} \quad y=-34/2-6/2(-7)=-34/2+42/2=4$$

3. Find the slope and y-intercept of $2x+7y=3$

$$2x+7y=3 \Rightarrow 7y=3-2x \Rightarrow y=3/7-2/7\,x$$

Slope is $-2/7$

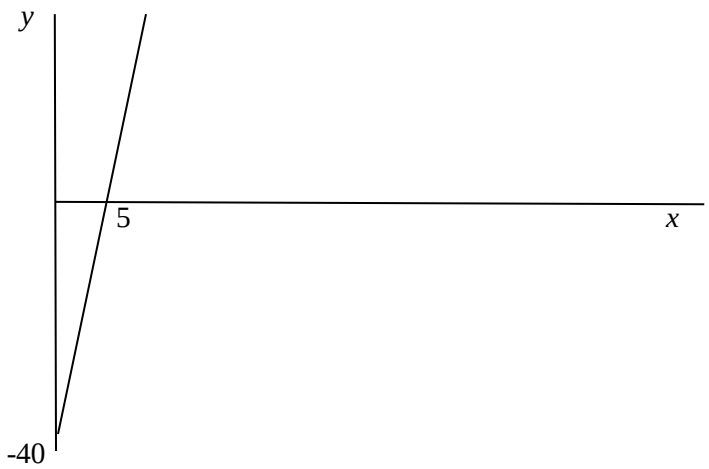
Set $x = 0$ to find the y-intercept is $3/7$.

4. Find the equation of the line with slope 3 through the point (1, -4)

Use the point-slope formula of $y-y_1=m(x-x_1)$

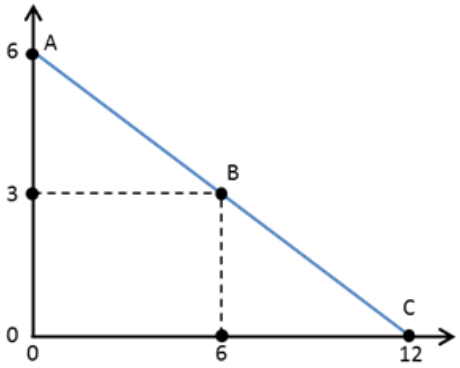
$$y+4=3(x-1)$$
$$y+4=3x-3$$
$$y=-7+3x$$

5. Find the *x* and *y*-intercepts of $40x - 5y = 200$ and graph the equation.



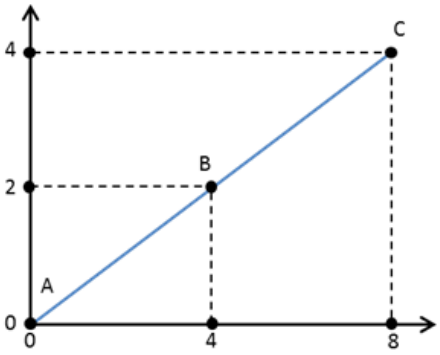
x-intercept is 5
y-intercept is

6. Calculate the slope of the line in the figure below:



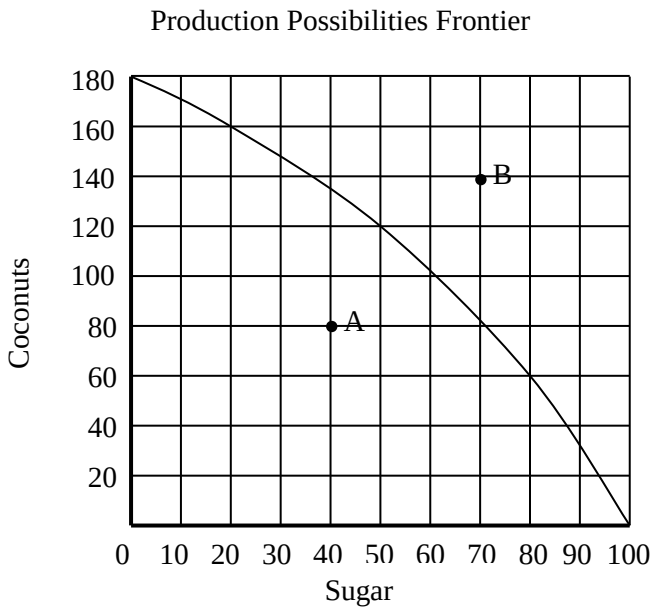
$$m = \frac{-3}{6} = -\frac{1}{2}$$

7. Calculate the slope of the line in the figure below:



$$m = \frac{2}{4} = \frac{1}{2}$$

8. The following graph shows the production possibilities frontier for a small country in the Caribbean.



a. If the country is currently producing 180 coconuts and 0 sugar, how many coconuts must they give up to make 20 sugar? *20*

b. If the country is currently producing 100 coconuts and 60 sugar, how many coconuts must they give up to move to 80 sugar? *40*

c. Does this country have increasing opportunity costs? Explain how you know that they do or do not and what it means to have increasing opportunity costs.
Yes. The PPF gets steeper moving from 180 coconuts and zero sugar to zero coconuts and 100 sugar. The answers to a and b also illustrate the increasing opportunity cost.

d. Give an example of a combination of coconuts and sugar that is attainable but not efficient and an example that is not attainable.
Any point that lies under the PPF, such as point A is attainable but not efficient. Any point above the PPF such as B is unattainable..

e. What two factors might shift the production possibilities frontier for this country? State what the factor is and then give an example related to the production of sugar and coconuts.
Increased labor (say from immigration) – more labor with given land would increase production. Improvements in harvesting technology would have the same effect.

9. Explain how a production possibility curve for agriculture goods and manufacturing goods would shift after each of the events described below:

   a. A drought in the Midwest reduces agricultural yield per acre.
   It would shift or rotate inward along the axis labeled "agricultural goods."

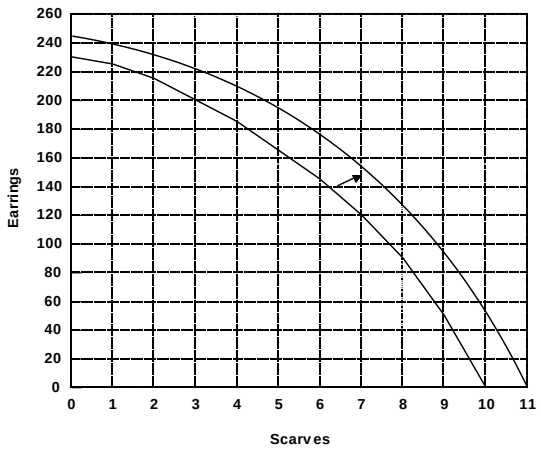
   b. Advances in computer technology lower the cost of producing manufactured goods but do not affect the cost of producing agricultural goods.
   It would shift or rotate outward along the axis labeled "manufacturing goods."

   c. Civil war disrupts the production of all goods equally in the United States.
   It would shift in along both axes.

10. A clothing accessory company produces scarves and earrings. Below are the production possibility combinations it can produce with the resources that it has.

Point	Scarves	Earrings
a	10	0
b	9	50
c	8	90
d	7	120
e	6	145
f	5	165
g	4	185
h	3	200
i	2	215
j	1	225
k	0	230

   a. Draw the production possibility curve in the space below placing "earrings" on the vertical axis.



   b. Suppose technological advances increase production of both earrings and scarves by 10% without increasing costs. Demonstrate the effect of this innovation on the production possibility curve you drew above.

   c. What is the slope of the PPF between points e and f? What does this slope mean?

$$slope = \frac{rise}{run} = \frac{145-165}{6-5} = -20$$

   This means we must give up 20 pairs of earrings to get one scarf.

d. Suppose the slope of the PPF were constant. (It isn't) If it were, what would this indicate?
   It would indicate constant opportunity cost.