

Econ 301  
Deiter, F09  
W IC #4 (10 pts)

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Assume B. Bop enjoys eating either hamburger 'meals' or pizza 'meals' and shopping every work day over the noon hour. For a given month, let:

- Y = quantity of hamburger 'meals' purchased
- X = quantity of pizza 'meals' purchased
- Z = hours spent shopping
- $P_y$  = the price or cost of one hamburger meal
- $P_x$  = the price or cost of one pizza meal
- $P_z$  = the cost of one hour of shopping
- I = income that B. Bop has to spend on lunch

Assume the following cases or possible situations where \* denotes a change from case #1.

Case	$P_y$	$P_x$	I
1	2	4	200
2	2	4	400*
3	2	8*	200
4	4*	4	200

1. Derive the math equations that represent the budget constraints associated with each case (w/Y on the left-hand side).

$$Y = \frac{I}{P_y} - \frac{P_x}{P_y} X \Rightarrow$$

- 1)  $Y = 100 - 2X$
- 2)  $Y = 200 - 2X$
- 3)  $Y = 100 - 4X$
- 4)  $Y = 50 - X$

2. Draw the budget lines in each of the attached graphs as follows:

- Case 1 in Figures A, B, C; label  $I_1$
- Case 2 in Figure A; label  $I_2$
- Case 3 in Figure B; label  $I_3$
- Case 4 in Figure C; label  $I_4$

See graphs

3. What is the numerical value of the slope of the budget line for Case 1 and explain the economic meaning of the slope number.

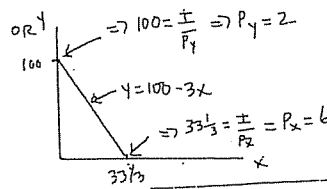
$$Y = 100 - 2X$$

$$\text{Slope} = \frac{\Delta Y}{\Delta X} = -2 \Rightarrow 2 \text{ hamburger meals can be exchanged for 1 pizza meal}$$

4. Assume B. Bop's budget constraint of \$200 is given by  $Y = 100 - 3X$ . In this situation, what is the cost to B. Bop of one hamburger meal ( $P_y$ ) and one pizza meal ( $P_x$ )?

$$Y = 100 - 3X \Rightarrow 100 = \frac{I}{P_y} \Rightarrow 100 = \frac{200}{P_y} \Rightarrow P_y = 2$$

$$\Rightarrow 3 = \frac{P_x}{2} \Rightarrow P_x = 6$$



5. Assume B. Bop's budget constraint is given by the equation  $Y = 40 - .1X$ . What is maximum attainable x? What is  $P_y$  if  $I = \$200$ ?

$$\text{Max } X \Rightarrow Y = 0$$

$$\Rightarrow 0 = 40 - .1X$$

$$\Rightarrow .1X = 40$$

$$\Rightarrow X = 400$$

Note:  $I = \$200$  = additional information

Figure A

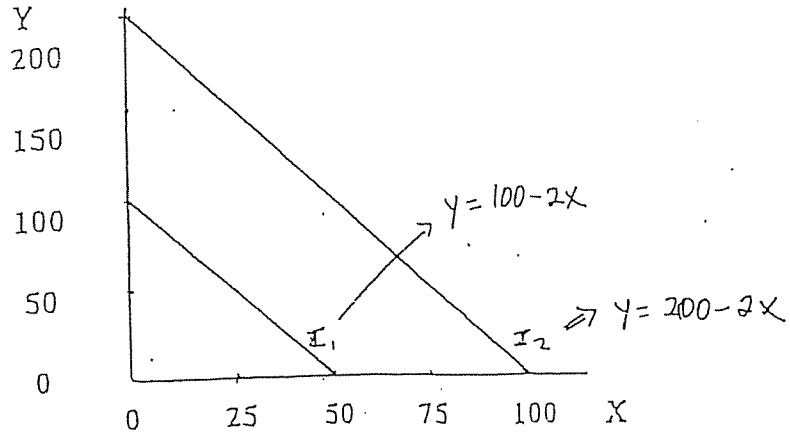


Figure B

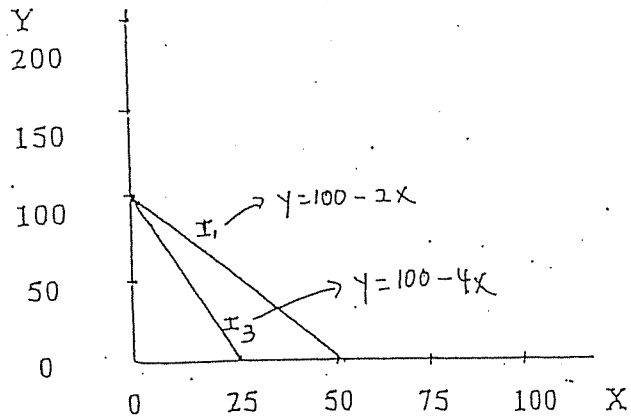


Figure C

