

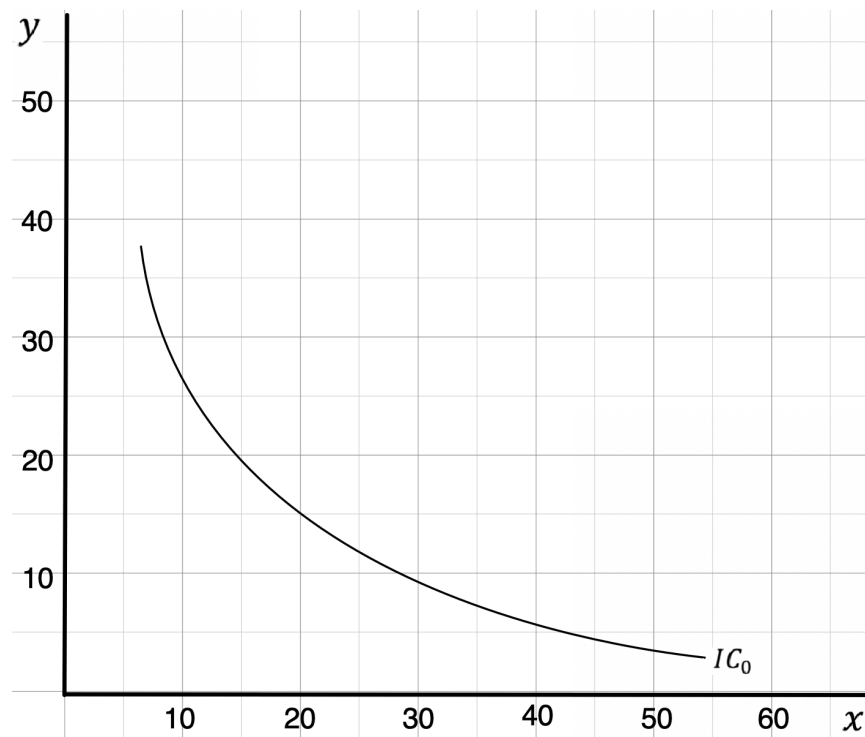
#1

12. Five consumers have the following marginal utility of apples and pears:

|        | Marginal<br>Utility of<br>Apples | Marginal<br>Utility of<br>Pears |
|--------|----------------------------------|---------------------------------|
| Claire | 6                                | 12                              |
| Phil   | 6                                | 6                               |
| Haley  | 6                                | 3                               |
| Alex   | 3                                | 6                               |
| Luke   | 3                                | 12                              |

The price of an apple is \$1, and the price of a pear is \$2. Which, if any, of these consumers are optimizing their choices of fruit? For those who are not, how should they change their spending?

#2 Given the price of  $x = 3$ , price of  $y = 4$ , and budget = 120.



- Draw the budget line and find the equilibrium with the given indifference curve  $IC$  in the diagram below.
- If the income increases from 120 to 150, where will be the new equilibrium so that the change in the consumption of  $x$  be such that the Income Elasticity of  $x$  is equal to 1.
- With the change of equilibrium you found in (B), what will be the Income Elasticity of  $y$ ?

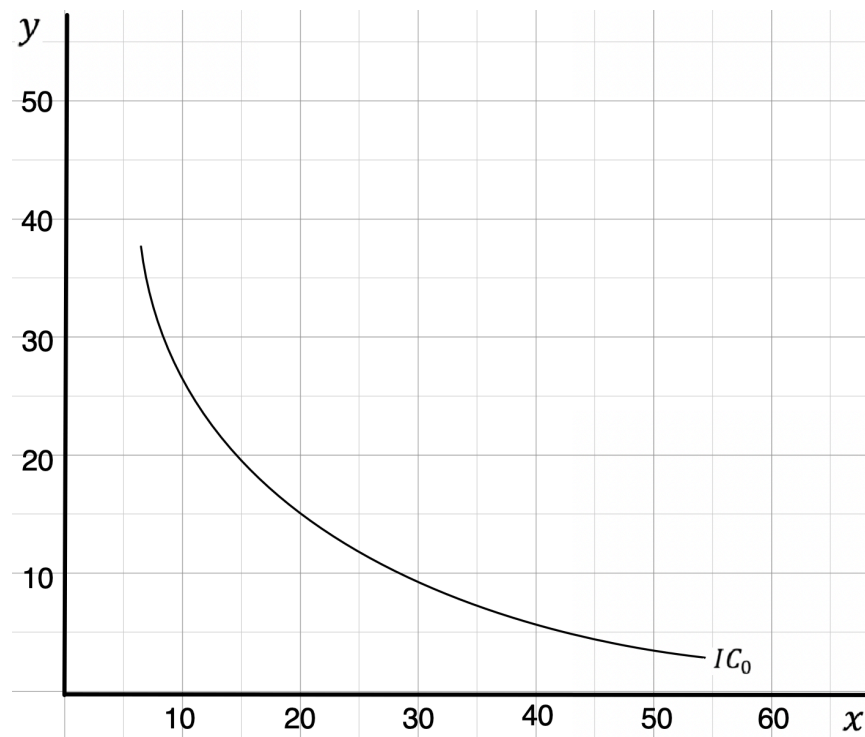
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|               | <small>represent x</small><br>Marginal<br>Utility of<br>Apples | <small>represent y</small><br>Marginal<br>Utility of<br>Pears |
|---------------|----------------------------------------------------------------|---------------------------------------------------------------|
| <u>Claire</u> | 6                                                              | 12                                                            |
| Phil          | 6                                                              | 6                                                             |
| Haley         | 6                                                              | 3                                                             |
| <u>Alex</u>   | 3                                                              | 6                                                             |
| Luke          | 3                                                              | 12                                                            |

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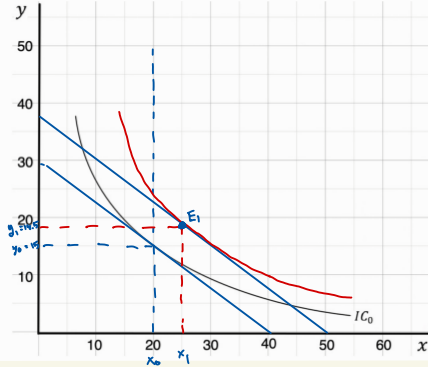
| $\frac{M_{ux}}{P_x}$ | $\frac{M_{uy}}{P_y}$ |
|----------------------|----------------------|
| 6                    | 6                    |
| 6                    | 3                    |
| 6                    | 1.5                  |
| 3                    | 3                    |
| 3                    | 6                    |

According to the formula:  $\frac{M_{ux}}{M_{uy}} = \frac{P_x}{P_y}$   
 $\frac{M_{ux}}{P_x} = \frac{M_{uy}}{P_y}$

From the given information, we can see that Claire / Alex had optimized their choices already.

- Phil and Haley should purchase more apples, in order to increase utility per one unit price.
- Luke should buy more pear, in order to increase utility.

#2 Given the price of  $x = 3$ , price of  $y = 4$ , and budget = 120.



A) Draw the budget line and find the equilibrium with the given indifference curve IC in the diagram below.

$$3x + 4y = 120$$

$$\text{at } x=0, y = \frac{120}{4} = 30 \#$$

$$\text{at } y=0, x = \frac{120}{3} = 40 \#$$

B) If the income increases from 120 to 150, where will be the new equilibrium so that the change in the consumption of  $x$  be such that the Income Elasticity of  $x$  is equal to 1.

$$3x + 4y = 150$$

$$\text{when } x=0, y = \frac{150}{4} = 37.5$$

$$\text{when } y=0, x = \frac{150}{3} = 50$$

$$\text{Formular } \eta_E^x = \frac{\% \Delta x}{\% \Delta I} = 1$$

$$1 = \frac{\% \Delta x}{(150-120)/120}$$

$$1 = \frac{\% \Delta x}{0.25}$$

$$0.25 = \Delta x$$

∴ We can conclude that  $x$  has increased by 25%.

$$\text{from } 20 \text{ to } 20 \times 1.25 = 25 \#$$

∴ And the equilibrium is at (25, 18.75)

C) With the change of equilibrium you found in (B), what will be the Income Elasticity of  $y$ ?

$$\text{At new } E (x_1, y_1) \rightarrow (25, 18.75)$$

$$\eta_y^y = \frac{\% \Delta y}{\% \Delta I} = \frac{(18.75-15)/15}{0.25} = 1 \#$$

the income Elasticity of  $y$  is also equal to 1.