

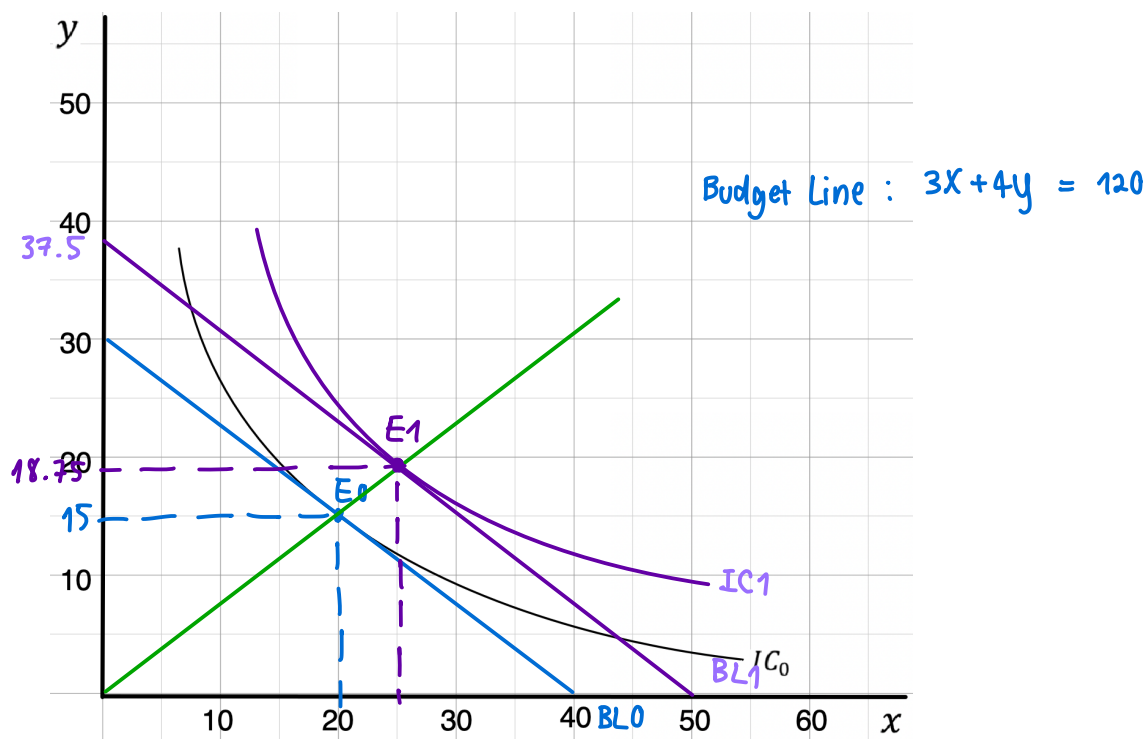
#1

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

	MU_x Marginal Utility of Apples	MU_y Marginal Utility of Pears	MU_x/MU_y
Claire	6	12	0.5
Phil	6	6	1
Haley	6	3	2
Alex	3	6	0.5
Luke	3	12	0.25

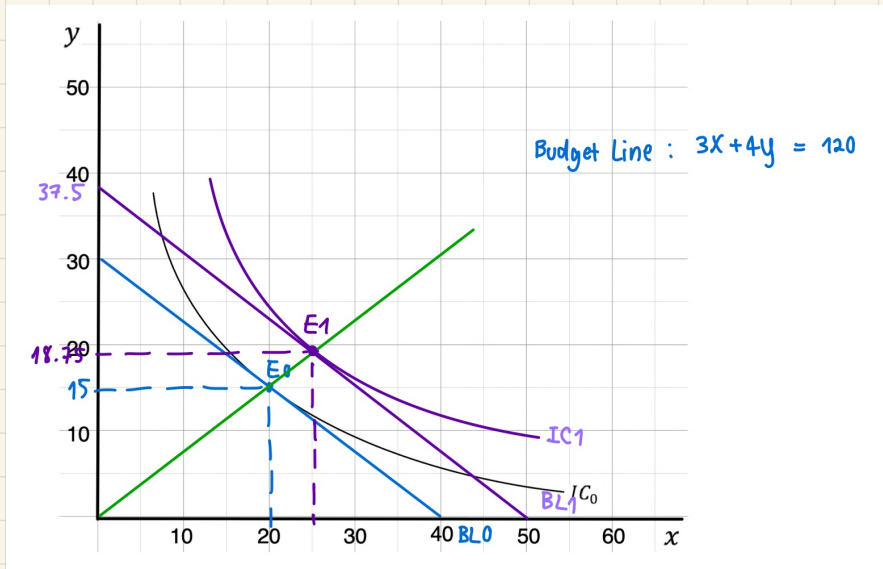
The price of an apple is \$1, and the price of a pear is \$2. Which, if any, of these consumers are optimizing their choices of fruit? For those who are not, how should they change their spending?

#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 ?

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



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.

$$\therefore \Delta I = \frac{150 - 120}{120} \times 100 = 25\%$$

η_I of x is equal to 1

$$\eta_I = 1 \text{ only when } \frac{\% \Delta Q_X}{\% \Delta I} = 1 \quad \% \Delta Q_X = \% \Delta I = 0.25$$

$$\% \Delta Q_X : \frac{Q_X^1 - Q_X^0}{Q_X^0} = 0.25$$

$$\% \Delta Q_X : Q_X^1 - Q_X^0 = 0.25 (Q_X^0)$$

$$Q_X^1 = 0.25 Q_X^0 + Q_X^0$$

$$Q_X^1 = 0.25 (20) + 20 = 25$$

$\therefore$ when income increases from 120 to 150, the consumption of x will increase from 20 to 25 so that elasticity of income is exactly equal to 1 ✖

$$\begin{aligned} \text{Budget Line : } 3X + 4y &= 150 \\ 3(25) + 4y &= 150 \\ y &= 18.75 \end{aligned}$$

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

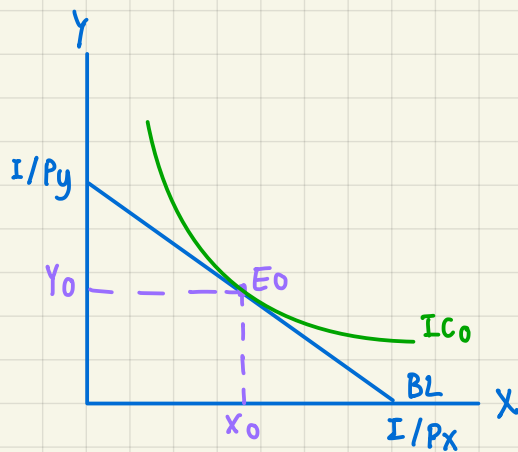
$$\eta_{Iy} = \frac{\% \Delta Q_y}{\% \Delta I} = \frac{\frac{18.75 - 15}{15}}{0.25} = \frac{0.25}{0.25} = 1 *$$

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At the equilibrium point E_0

- 1) Slope of BL = Slope of IC (utility maximized)
- 2) E_0 is on the budget line (choice is possible)

$$\text{Slope of BL : } \frac{\Delta y}{\Delta x} = - \frac{I/P_y}{I/P_x} = - \frac{P_x}{P_y}$$

$$\text{Slope of IC : } MU_x \Delta x + MU_y \Delta y = 0$$

$$\frac{\Delta y}{\Delta x} = - \frac{MU_x}{MU_y}$$

$\therefore$ Claire and Alex are optimizing their choice, but the others aren't