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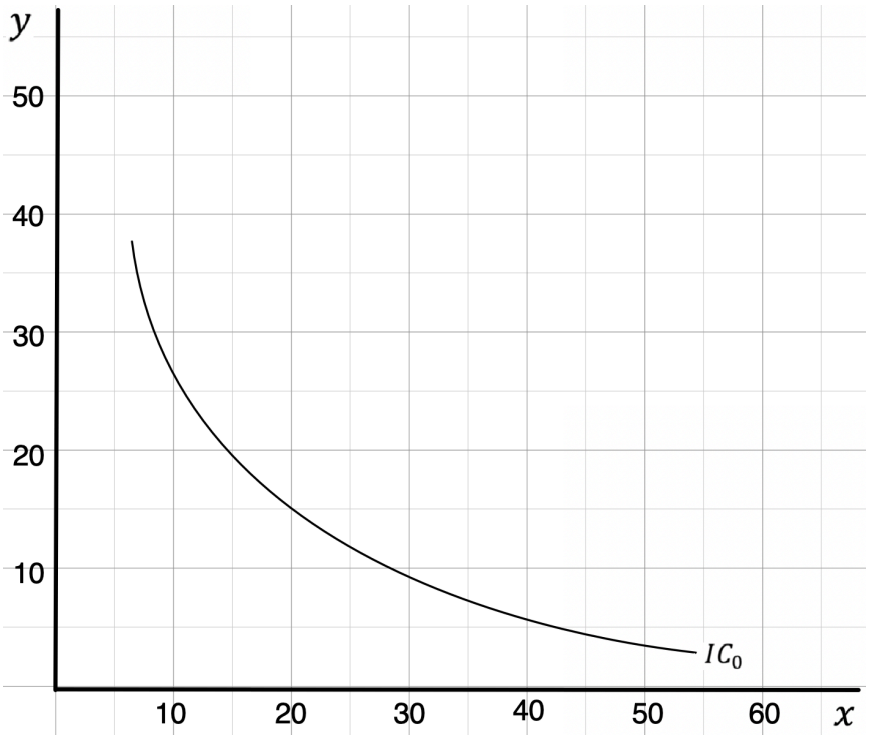
#1

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

	Marginal Utility of Apples	Marginal Utility of 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.



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

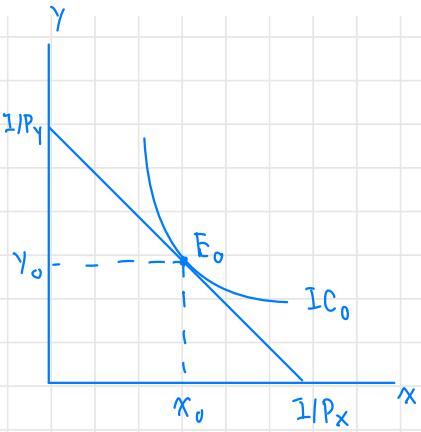
#1

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

	MU_x Marginal Utility of Apples	MU_y Marginal Utility of Pears	$\frac{MU_x}{MU_y}$
Claire	6	12	$\frac{1}{2}$
Phil	6	6	1
Haley	6	3	2
Alex	3	6	$\frac{1}{2}$
Luke	3	12	$\frac{1}{4}$

P_x P_y

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?



At the equilibrium point E_0, it is observable that

1) Slope of BL = Slope of IC

2) E_0 is on the budget line

Slope of BL: $\frac{\Delta Y}{\Delta X} = -\frac{I/P_y}{I/P_x} = -\frac{P_x}{P_y}$

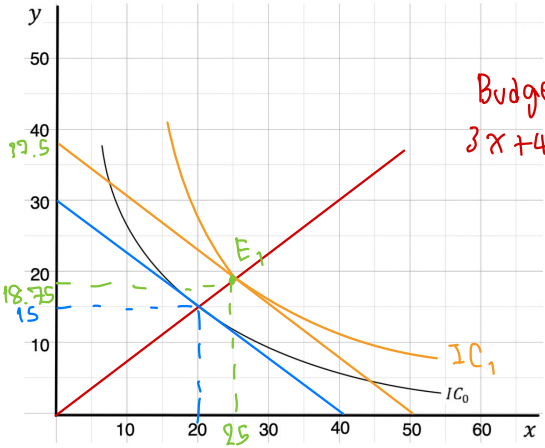
Slope of IC: $\frac{\Delta Y}{\Delta X} = -\frac{MU_x}{MU_y}$

∴ According to the table, $\frac{MU_x}{MU_y}$ or $\frac{P_x}{P_y}$ of Claire and Alex are exactly the same. To sum up, Claire and Alex are optimizing their choices of fruits.

∴ Phil and Haley $\Rightarrow \frac{P_x}{P_y} < \frac{MU_x}{MU_y}$, so they should consume more of X

∴ Luke $\Rightarrow \frac{P_x}{P_y} > \frac{MU_x}{MU_y} \Rightarrow$ He should consume less of X, but more of Y

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



Budget line
$3x + 4y = 120$

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.

Given that income ↑ (120 → 150) ∴ $\%\Delta I = \frac{150-120}{120} \times 100 = 25\%$

$\varepsilon_{I_x} = 1$ when $\frac{\%\Delta Q_x}{\%\Delta I} = 1$ (25% / 25%)

$$\%\Delta Q_x = \frac{Q^1_x - Q^0_x}{Q^0_x} = 0.25$$

$$Q^1_x = 0.25Q^0_x + Q^0_x$$

$$Q^1_x = 0.25(20) + 20 = 25$$

∴ the income increases from 120 to 150, the consumption of x increase from 20 to 25 in which $\varepsilon_{I_x} = 1$

∴ BL : $3x + 4y = 120$ | $y = 18.75$

$3(25) + 4y = 120$

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

$$\varepsilon_{I_y} = \frac{\% \Delta Q_y}{\% \Delta I} = \frac{\frac{18.75 - 15}{15}}{0.25} = \frac{0.25}{0.25} = 1 \ \text{※}$$