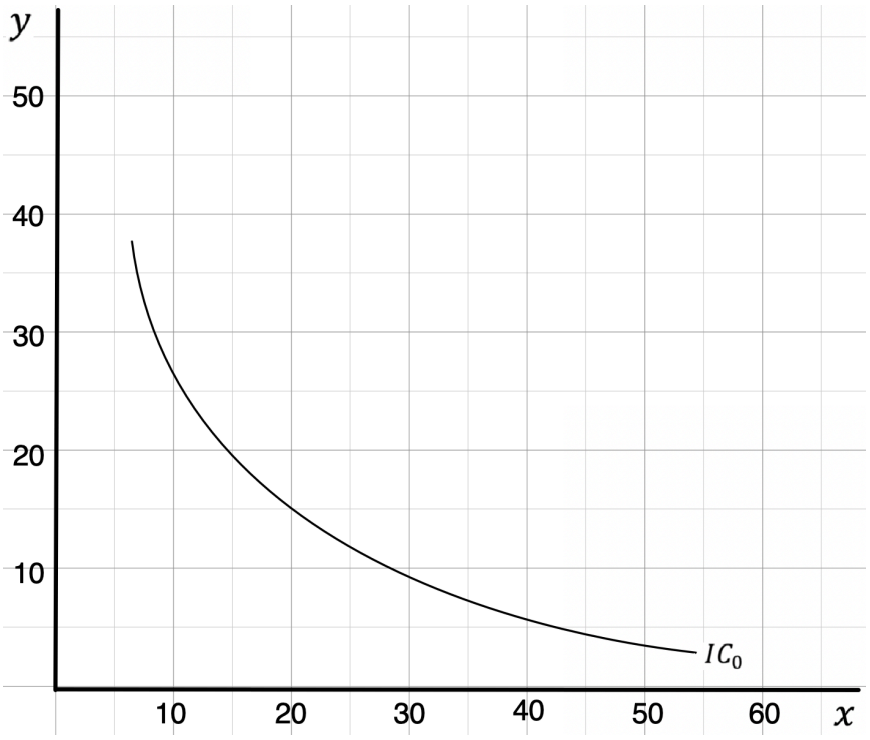
#1

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?

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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?

Let x be the number of apples
and y be the number of pears

$$MRS = -\frac{MU_x(x_1, y_1)}{MU_y(x_1, y_1)} = -\frac{P_x}{P_y}$$

$$\therefore MRS = \frac{1}{2}$$

Claire : $\frac{6}{12} = \frac{1}{2}$

Phile : $\frac{6}{6} \neq \frac{1}{2}$

Haley : $\frac{6}{3} \neq \frac{1}{2}$

Alex : $\frac{3}{6} = \frac{1}{2}$

Luke : $\frac{3}{12} \neq \frac{1}{2}$

∴ Claire and Alex are optimizing their choice of fruit.

For those who are not:
Phile can buy less apples => $MU_x = 3$ to optimizing his choice
Haley can buy more pears => $MU_y = 12$ to optimizing his choice
Luke can buy more apples => $MU_x = 6$ to optimizing his choice

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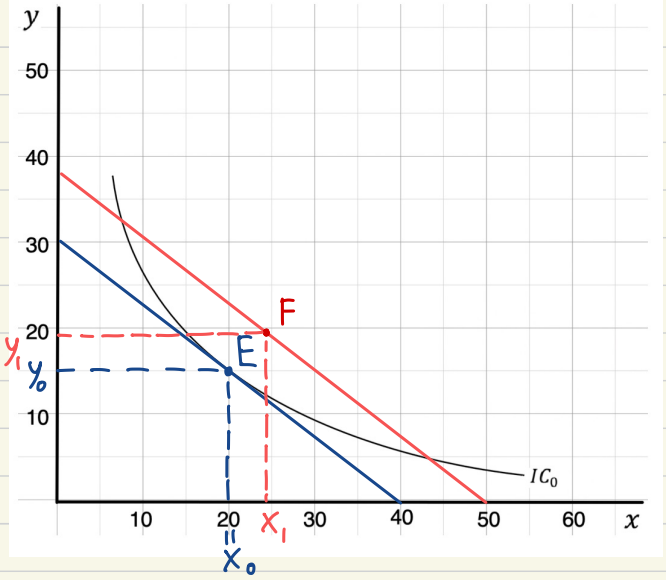

A) Draw the budget line and find the equilibrium with the given indifference curve IC in the diagram below.

$3x + 4y = 120$

$x = 0,\ 4y = 120 \qquad y = 30$

$y = 0,\ 3x = 120 \qquad x = 40$

∴ The equilibrium is at point $E = (x_0, y_0) = (20, 15)$

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.

The income increase from 120 to 150, the new budget line will be

$3x + 4y = 150$

$x = 0,\ 4y = 150 \qquad y = 37.5$

$y = 0,\ 3x = 150 \qquad x = 50$

$$\eta_I = \frac{\%\Delta Q_x}{\%\Delta I} = \frac{\frac{X_1 - 20}{20}}{\frac{150 - 120}{120}}$$

$$1 = \frac{X_1 - 20}{5}$$

$$5 = X_1 - 20$$

$$X_1 = 25$$

$X_1 = 25,\ 3(25) + 4y = 150$

$4y = 75$

$y = 18.75$

∴ The new equilibrium is at point $F = (x_1, y_1) = (25, 18.75)$

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

$$\eta_I = \frac{\%\Delta Q_y}{\%\Delta I} = \frac{\frac{18.75 - 15}{15}}{\frac{150 - 120}{120}}$$

$$= \frac{0.25}{0.25} = 1$$

∴ Income Elasticity of y is equal to 1 #