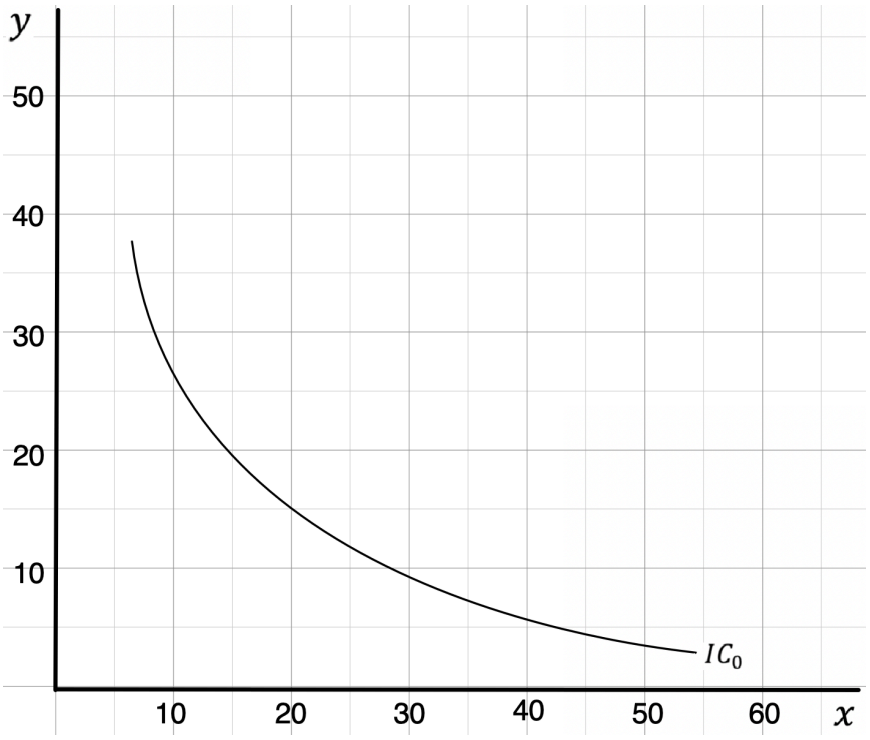
#1

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?

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

	X Marginal Utility of Apples	Y 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?

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

- Optimum condition

$$-\frac{MU_x}{MU_y} = -\frac{P_x}{P_y} = \frac{1}{2} = MRS$$

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

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

Phil: $\frac{6}{6} = \frac{1}{2}$

$\therefore 1 \neq \frac{1}{2} \longrightarrow$ not optimum

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

$\therefore 2 \neq \frac{1}{2} \longrightarrow$ not optimum

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

$\therefore \frac{1}{2} = \frac{1}{2} \longrightarrow$ optimum

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

$\therefore \frac{1}{4} \neq \frac{1}{2} \longrightarrow$ not optimum

$\therefore$ Claire and Alex optimize their choice
Phil, Haley, and Luke haven't optimized their choice.

=> Change their spending

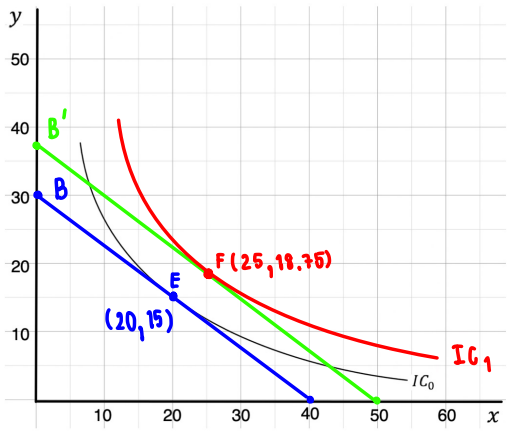
Phil: consume more apples until $MU_x = 3$

Haley: consume fewer pears until $MU_y = 12$

Alex: Consume more pears until $MU_y = 6$

(2)

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



(A) Budget line. $P_x X + P_y Y = B$

$3X + 4Y = 120$

When $X = 0$, $Y = 30$

$Y = 0$, $X = 40$

∴ The equilibrium is at E $(20, 15)$

(B) If income increases from 120 to 150,

Budget line: $3X + 4Y = 150$

When $X = 0$, $Y = 37.5$

$Y = 0$, $X = 50$

$$\eta_I = \frac{\% \Delta Q_x}{\% \Delta I} = \frac{\frac{X_1 - 20}{20} \times 100\%}{\frac{150 - 120}{120} \times 100\%}$$

$$1 = \frac{X_1 - 20}{0.25(20)}$$

$$5 = X_1 - 20$$

$$X_1 = 25 \Rightarrow Y_1 = \frac{150 - 3(25)}{4} = 18.75$$

∴ New equilibrium is at F $(25, 18.75)$

(C) Income elasticity of y at $(25, 18.75)$

$$\eta_I = \frac{\% \Delta Q_Y}{\% \Delta I}$$

$$= \frac{\frac{18.75 - 15}{15} \times 100}{\frac{150 - 120}{120} \times 100}$$

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

∴ Income elasticity of y is 1 #