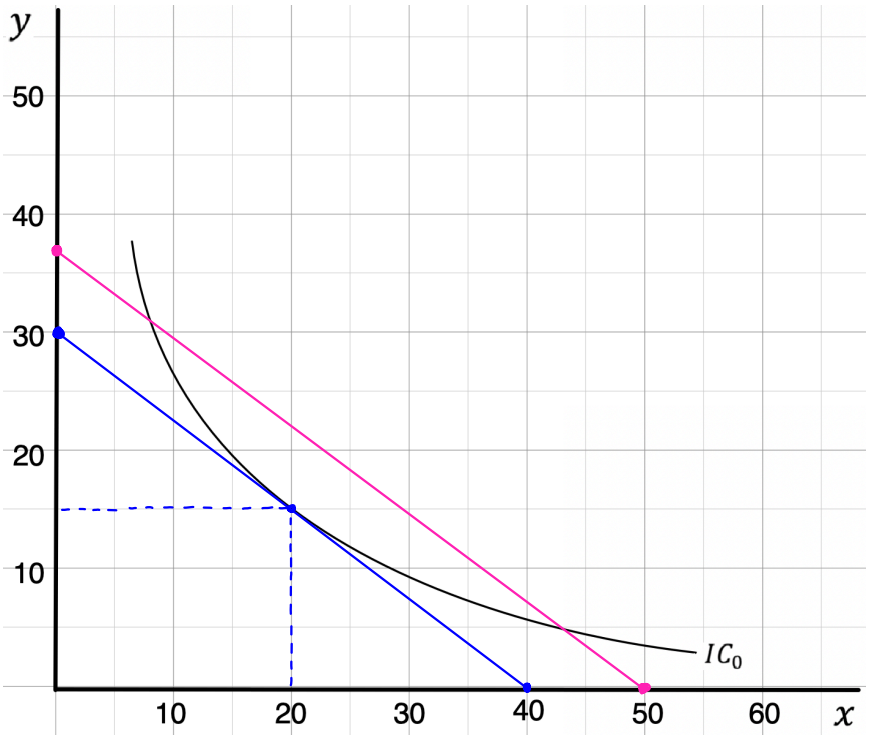
#1

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	$\frac{1}{4}$

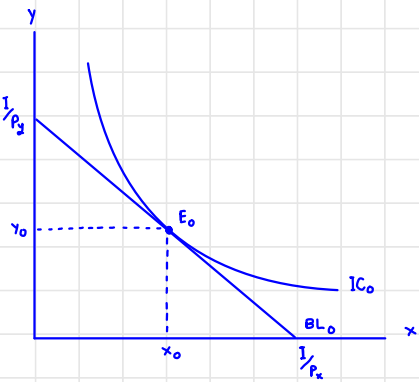
P_x P_y

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?

$I = P_x x + P_y y$

$I = 0 + P_y y$

$\frac{I}{P_y} = y$



$I = P_x x + P_y y$

$I = P_x x + 0$

$\frac{I}{P_y} = x$

At the equilibrium point E_0, it shows that

1) Slope of BL = Slope of IC (Utility is maximized)
2) E_0 is on the budget line (the choice is feasible)

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

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

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

Slope of BL = Slope of IC

$-\frac{P_x}{P_y} = -\frac{MU_x}{MU_y}$

$(P_x = 1, P_y = 2)$

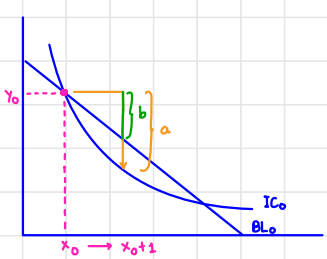
$\frac{P_x}{P_y} = \frac{MU_x}{MU_y} = \frac{1}{2}$

Therefore, Claire and Alex are optimizing their choices, while others are not.

They need to adjust their choices

- Phil and Harley → $\frac{P_x}{P_y} < \frac{MU_x}{MU_y}$ → It means that they want to sacrifice a unit of y to gain more x while, in the market requires only b unit of y to gain more x ($a > b$)

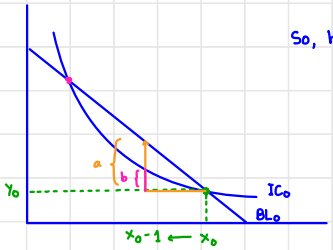
So, they should consume more units of x (apple) to optimize their choices



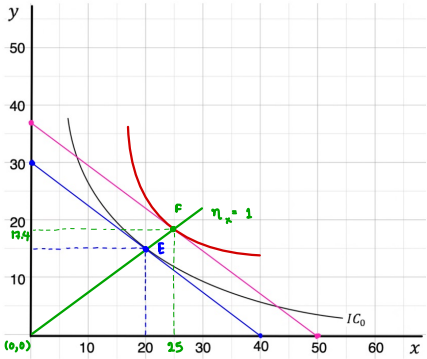
- Luke → $\frac{P_x}{P_y} > \frac{MU_x}{MU_y}$.

It means that Luke is forced to give up 1 unit of x to get just b unit of y that satisfy him, but the market give him a unit (a > b)

So, he should consume less of x (apple) and consume more of y (pear) #



#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?

(A) At $y=0$; $P_x x + P_y y = 120$

$P_x x + 0 = 120$

$x = \frac{120}{P_x}$

$x = \frac{120}{3} = 40$

$(40,0)$

At $x=0$; $P_x x + P_y y = 120$

$0 + P_y y = 120$

$y = \frac{120}{P_y}$

$y = \frac{120}{4} = 30$

$(0,30)$

(B) If Income increase from 120 to 150 the new budget line will be changed to $(0,19)$ and $(25,0)$, so the new equilibrium will be at point F $(25, 17.4)$ #

New Budget line $= -\frac{P_x}{P_y} = -\frac{50}{37.5}$

x-intercept

At $y=0$; $P_x X + P_y y = 150$

$P_x x + 0 = 150$

$x = \frac{150}{P_x}$

$x = \frac{150}{3} = 50$

$(x,y) = (50,0)$

Y-intercept

At $x=0$ $P_x x + P_y y = 150$

$0 + P_y y = 150$

$y = \frac{150}{P_y}$

$y = \frac{150}{4} = 37.5$

$(x,y) = (0,37.5)$

(C) With the new equilibrium, the Income elasticity of y will be equal

$$\eta_y = \frac{\% \Delta y}{\% \Delta I} = \frac{\frac{37.5-30}{30}}{\frac{150-120}{120}} = \frac{0.25}{\frac{30}{120}}$$

$$= 0.25 \times \frac{120}{30} = 4$$

$\eta_y = 1$

∴ Therefore, the income elasticity of y will be equal 1 #