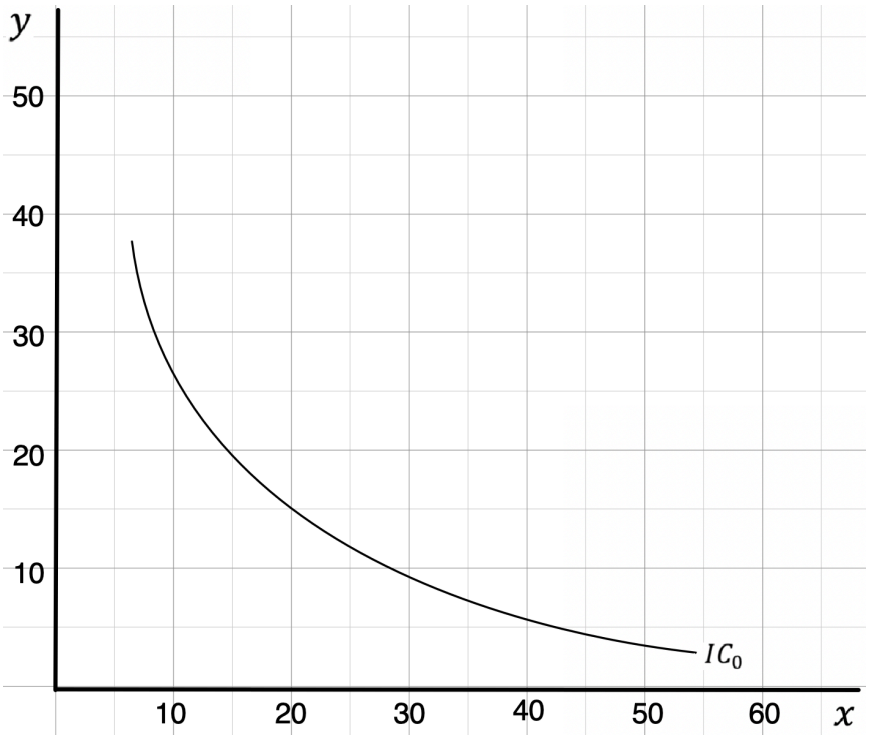
#1

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

- Claire: $\frac{6}{12} = \frac{1}{2}$ = max U
- Phil: $1 > \frac{1}{2}$ → X↑ Y↓ 1U. → (X↑ Y↓) (ถ้าไม่ max … ถ้าจะให้ max ต้อง)
- Haley: $\frac{6}{3} > \frac{1}{2}$ → ↓
- Alex: $\frac{3}{6} = \frac{1}{2}$ → max
- Luke: $\frac{3}{12} < \frac{1}{2}$ → X↑ Y↓ 0.25 U. → (Y↑ X↓)

The price of an apple (X) is $1, and the price of a pear (Y) 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?

★ To maximise consumer's utility, the slope of IC & BL :

$$\underset{MRS}{\frac{MU_x}{MU_y}} = \underset{\text{slope BL}}{\frac{P_x}{P_y}}$$

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

★ Claire → $\frac{6}{1} = \frac{12}{2}$; this means that when spending $1 on apple, claire's utility will equal to $1 spend on pear. it reflects that Claire has already have a maximise utility.

★ Phil → $\frac{6}{1} > \frac{6}{2}$; this means that when spending $1 on apple, Phil will gain more utility than $1 spending on pear. Therefore Phil should consume more apples and decrease pear in order to raise utility.

★ Haley → $\frac{6}{1} > \frac{3}{2}$; this means that when spending $1 on apple, Haley will gain more utility than $1 spending on pear. Therefore Haley should consume more apples and decrease pear in order to raise utility.

★ Alex → $\frac{3}{1} = \frac{6}{3}$; this means that when spending $1 on apple, Alex's utility will equal to $1 spend on pear. it reflects that Alex has already have a maximise utility.

★ Luke → $\frac{3}{1} < \frac{12}{2}$; this means that when spending $1 on apple, Luke will gain less utility than $1 spending on pear. Therefore Haley should consume less apples and increase pear in order to raise utility.

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

$BL = (P_x)(X) + (P_y)(Y)$

$120 = 3X + 4y$

★ Intercept x, $y = 0$ → $120 = 3X + 4(0)$

$\frac{120}{3} = X$

$40 = X$

★ Intercept y; $X = 0$ → $120 = 3(0) + 4y$

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

$30 = y$

★ Slope of BL $= \frac{\Delta Y}{\Delta X}$

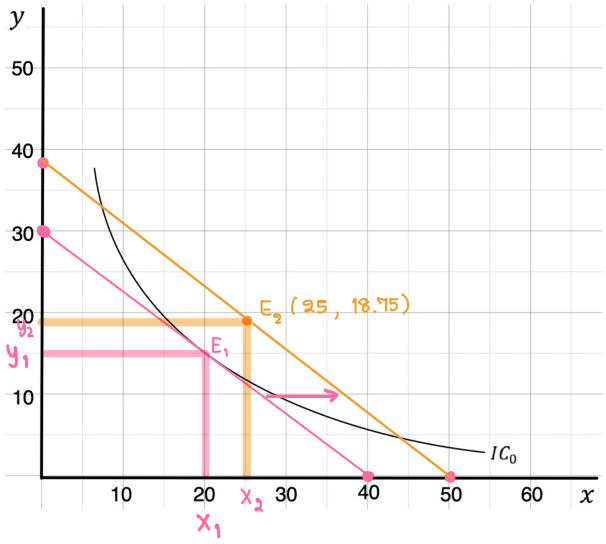
$= \frac{B}{P_y} \div \frac{B}{P_x}$

$= \frac{B}{P_y} \times \frac{P_x}{B}$

$= \frac{P_x}{P_y}$

$= \frac{3}{4}$

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.



→ Intercept x; $y = 0$: $\frac{B}{P_x} = X$

$\frac{150}{3} = X$

$50 = X$

→ Intercept y; $X = 0$ $\frac{B}{P_y} = y$

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

$37.5 = y$

Income increase by:

$\frac{I_2 - I_1}{I_1} \times 100 \Rightarrow \frac{150 - 120}{120} \times 100 = 25\%$

Income elasticity of x = 1

I ↑ 1% → Q_x ↑ 1%

I ↑ 25% → Q_x ↑ 25%

→ 25% = % $\Delta Q_x = \frac{Q_2 - Q_1}{Q_1} \times 100$

$25 = \frac{Q_2 - 20}{20} \times 100$

$\frac{25 \times 20}{100} = Q_2 - 20$

$25 = Q_2$

→ $150 = 3X + 4y$

$150 = 3(25) + 4y$

$18.75 = y$

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

$$\eta_I = \frac{\%\ \Delta Q^d_y}{\%\ \Delta I}$$

$$= \frac{\frac{18.75 - 15}{15} \times 100}{25\%}$$

$$= \frac{25\%}{25\%}$$

$$= 1$$

$\therefore \eta_I = 1$, which mean $I \uparrow 1\% \rightarrow Q^d_y \uparrow 1\%$