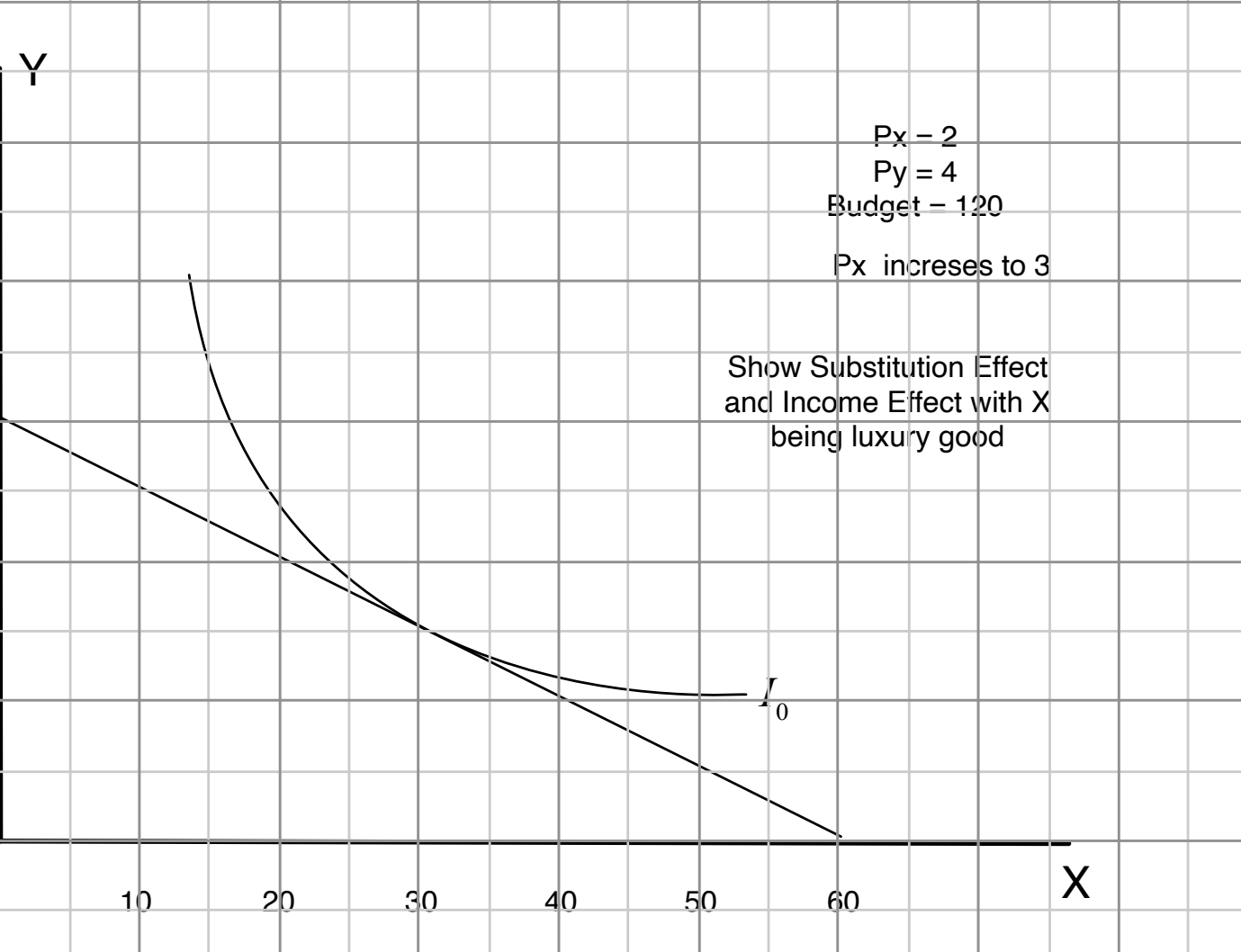
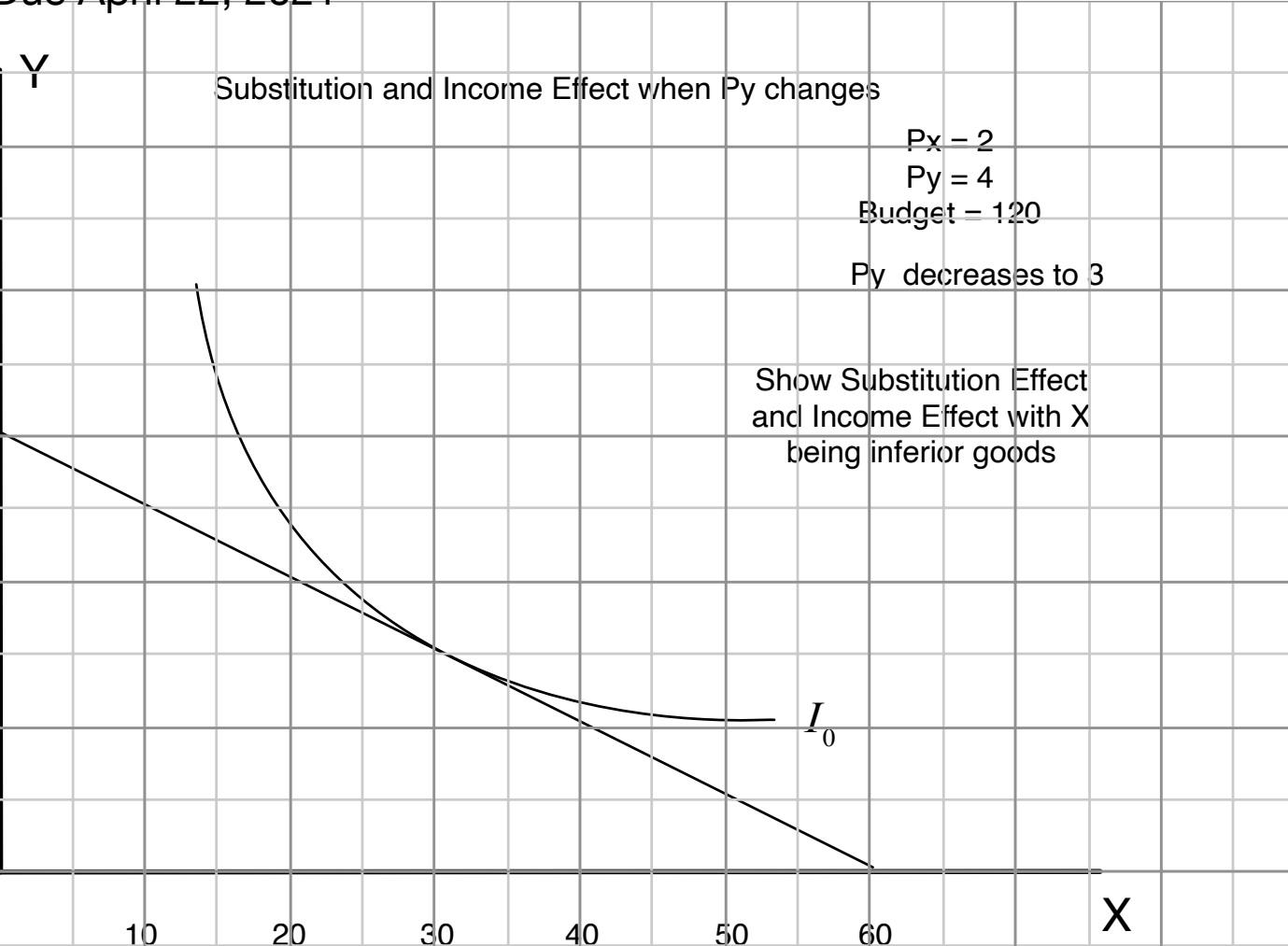
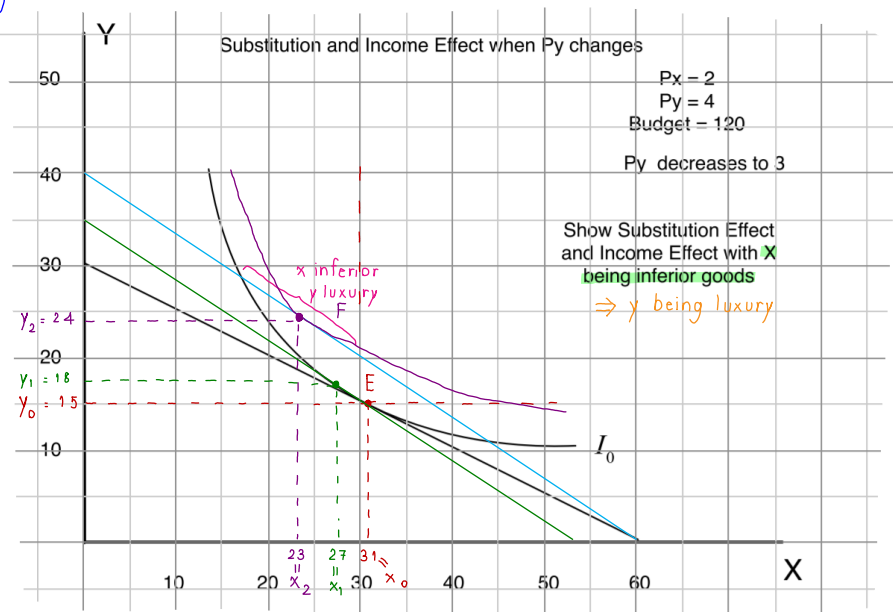




1



$$2X + 4Y = 120 \quad 2X + 3Y = 120$$

$$X = 0, 4Y = 120 \quad X = 0, 3Y = 120$$

$$Y = 30 \quad Y = 40$$

$$Y = 0, 2X = 120 \quad Y = 0, 2X = 120$$

$$X = 60 \quad X = 0$$

$$\text{relative price} = \frac{-P_x}{P_y} = \frac{-2}{4} = -\frac{1}{2} \quad \text{relative price} = \frac{-P_x}{P_y} = \frac{-2}{3}$$

$$SE = \begin{cases} \Delta X = X_1 - X_0 = 27 - 31 = -4 < 0 \\ \Delta Y = Y_2 - Y_0 = 18 - 15 = 3 > 0 \end{cases}$$

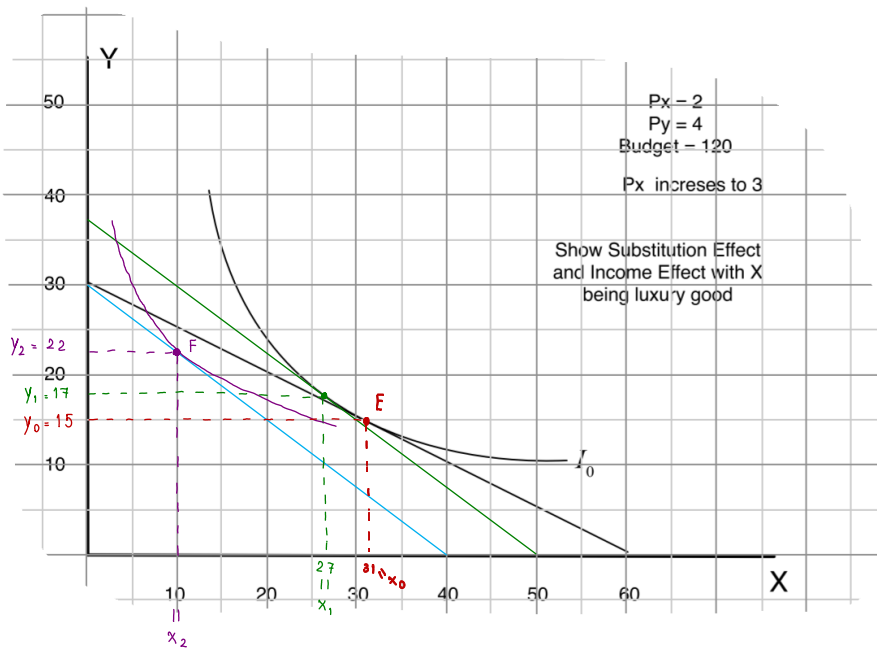
x & y are substitute

$$IE = \begin{cases} \Delta X = X_2 - X_1 = 23 - 27 = -4 < 0 \\ \Delta Y = Y_2 - Y_1 = 24 - 18 = 6 > 0 \end{cases}$$

$\Rightarrow$ real income increases $\rightarrow$ consume less x , more y

$$TE = \begin{cases} \Delta X = X_2 - X_0 = 23 - 31 = -8 \\ \Delta Y = Y_2 - Y_0 = 24 - 15 = 9 \end{cases}$$

2



$$2X + 4Y = 120 \quad 3X + 4Y = 120$$

$$X = 0, 4Y = 120 \quad X = 0, 4Y = 120$$

$$Y = 30 \quad Y = 30$$

$$Y = 0, 2X = 120 \quad Y = 0, 3X = 120$$

$$X = 60 \quad X = 40$$

$$\text{relative price} = \frac{-P_x}{P_y} = \frac{-2}{4} = -\frac{1}{2} \quad \text{relative price} = \frac{-P_x}{P_y} = \frac{-3}{4}$$

$$SE = \begin{cases} \Delta X = X_1 - X_0 = 27 - 31 = -4 < 0 \\ \Delta Y = Y_2 - Y_0 = 17 - 15 = 2 > 0 \end{cases}$$

x & y are substitute

$$IE = \begin{cases} \Delta X = X_2 - X_1 = 10 - 27 = -17 < 0 \\ \Delta Y = Y_2 - Y_1 = 22 - 17 = 5 > 0 \end{cases}$$

$\Rightarrow$ real income increases $\rightarrow$ consume less x , more y

$$TE = \begin{cases} \Delta X = X_2 - X_0 = 10 - 31 = -21 \\ \Delta Y = Y_2 - Y_0 = 22 - 15 = 7 \end{cases}$$