HW#9 Due April 22, 2021

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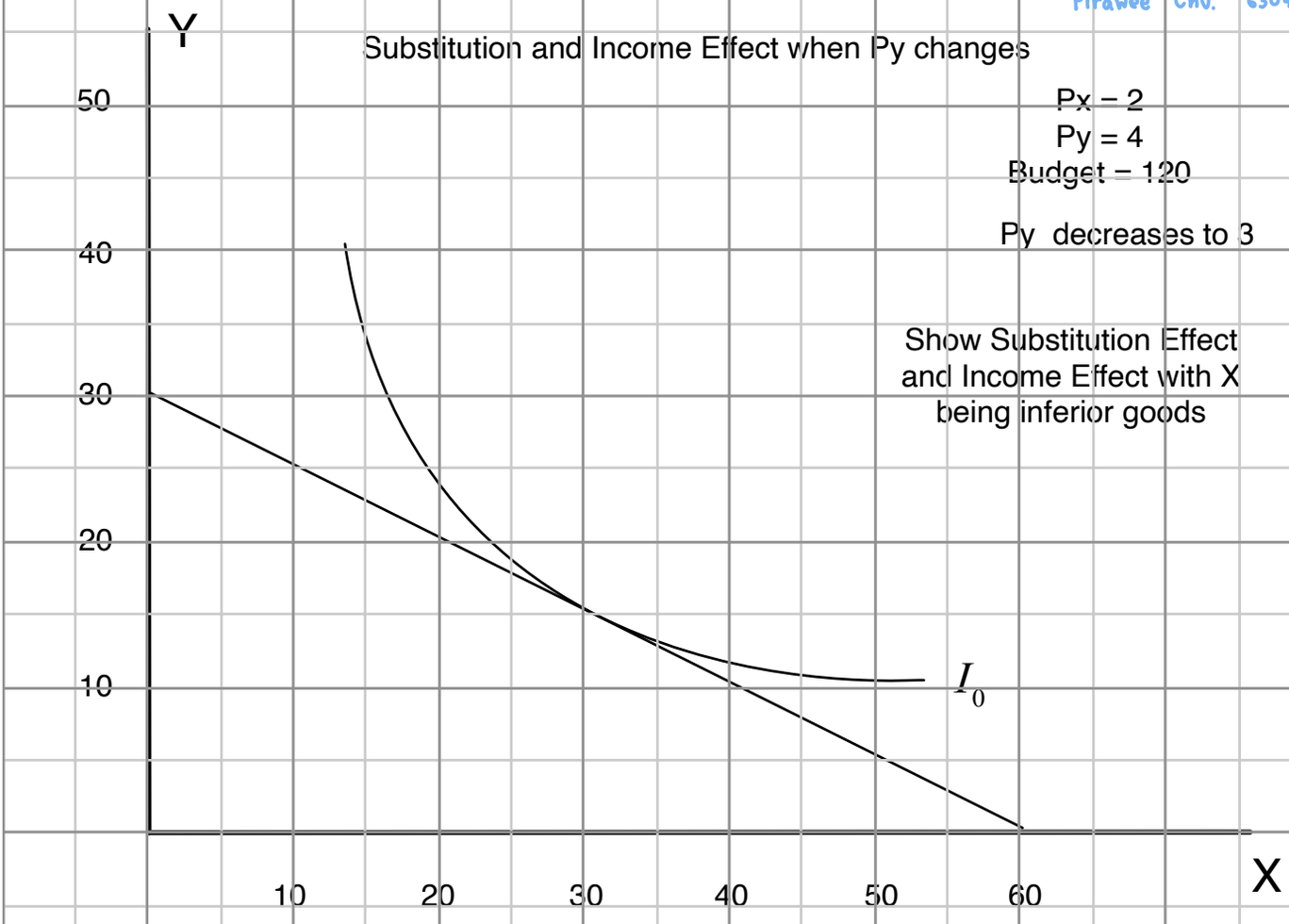
Substitution and Income Effect when Py changes

Px – 2
Py = 4
Budget – 120

Py decreases to 3

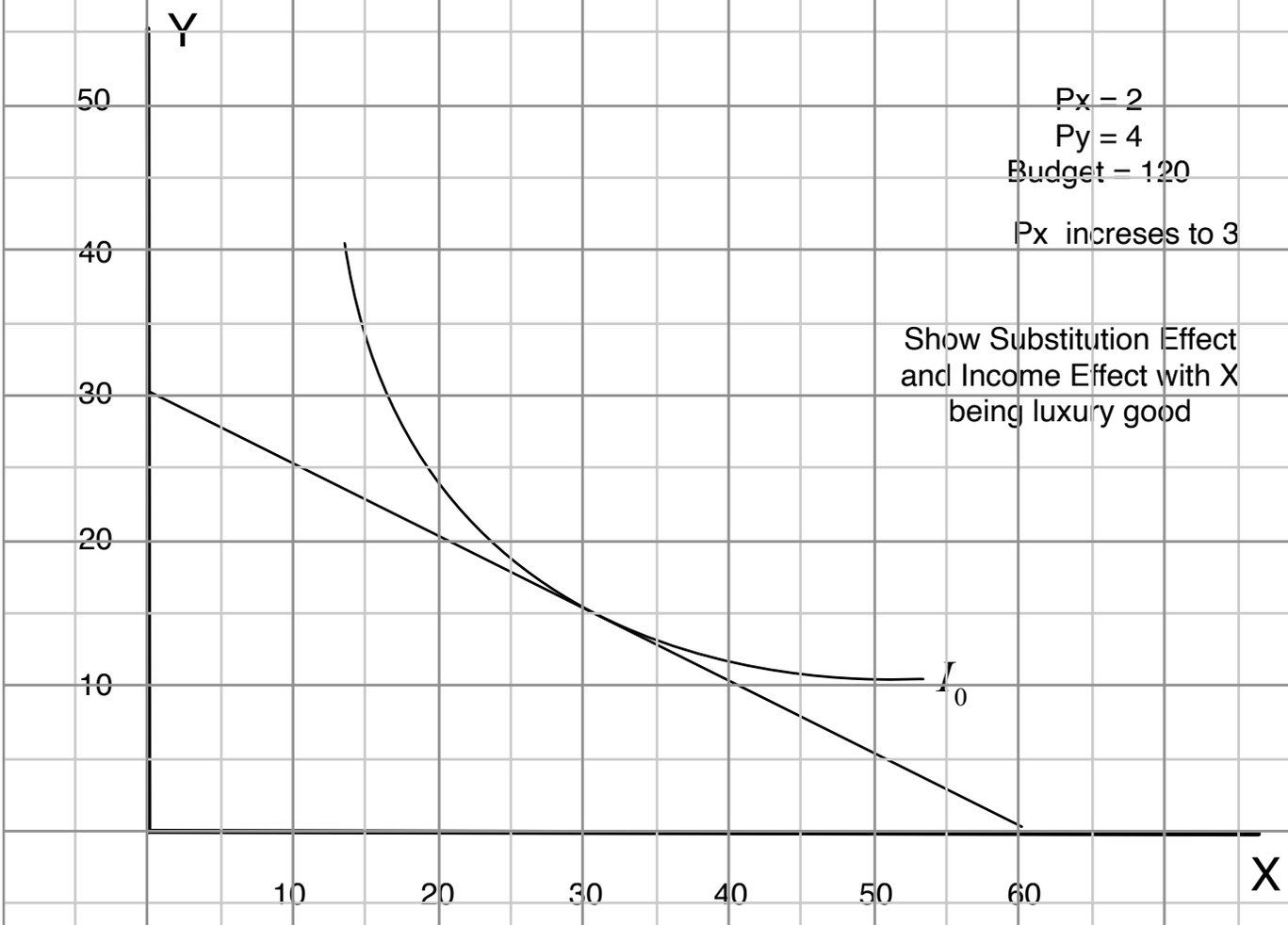
Show Substitution Effect and Income Effect with X being inferior goods



Px – 2
Py = 4
Budget – 120

Px increses to 3

Show Substitution Effect and Income Effect with X being luxury good



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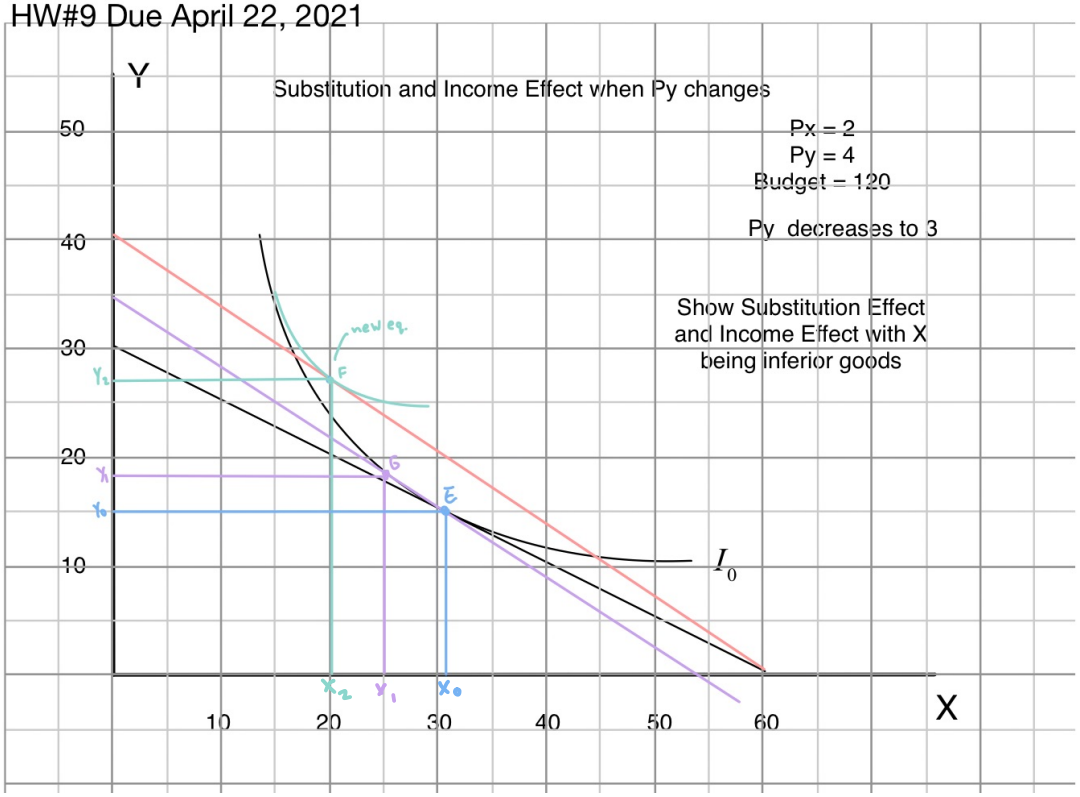

$P_X = 2$, $P_Y = 4$, Budget $= 120$

↳ $2X + 4Y = 120$ if $Y=0$, $X=60$

$X=0$, $Y=30$

$P_Y \downarrow$ to 3 $\Rightarrow$ $2X + 3Y = 120$ if $Y=0$, $X=60$

$X=0$, $Y=40$

S.E. $= \begin{cases} \Delta X = X_1 - X_0 = 25 - 31 = -6 < 0 \\ \Delta Y = Y_1 - Y_0 = 19 - 15 = 4 > 0 \end{cases}$

I.E. $= \begin{cases} \Delta X = X_2 - X_1 = 20 - 25 = -5 < 0 \\ \Delta Y = Y_2 - Y_1 = 27 - 19 = 8 > 0 \end{cases}$

T.E. $= \begin{cases} \Delta X = X_2 - X_0 = 20 - 31 = -11 < 0 \\ \Delta Y = Y_2 - Y_0 = 27 - 15 = 12 > 0 \end{cases}$

∴ P_Y decrease → consume less X , more Y

X and Y are substitute good

Move real income → consume less X and more Y

X is inferior good, Y is luxury good.

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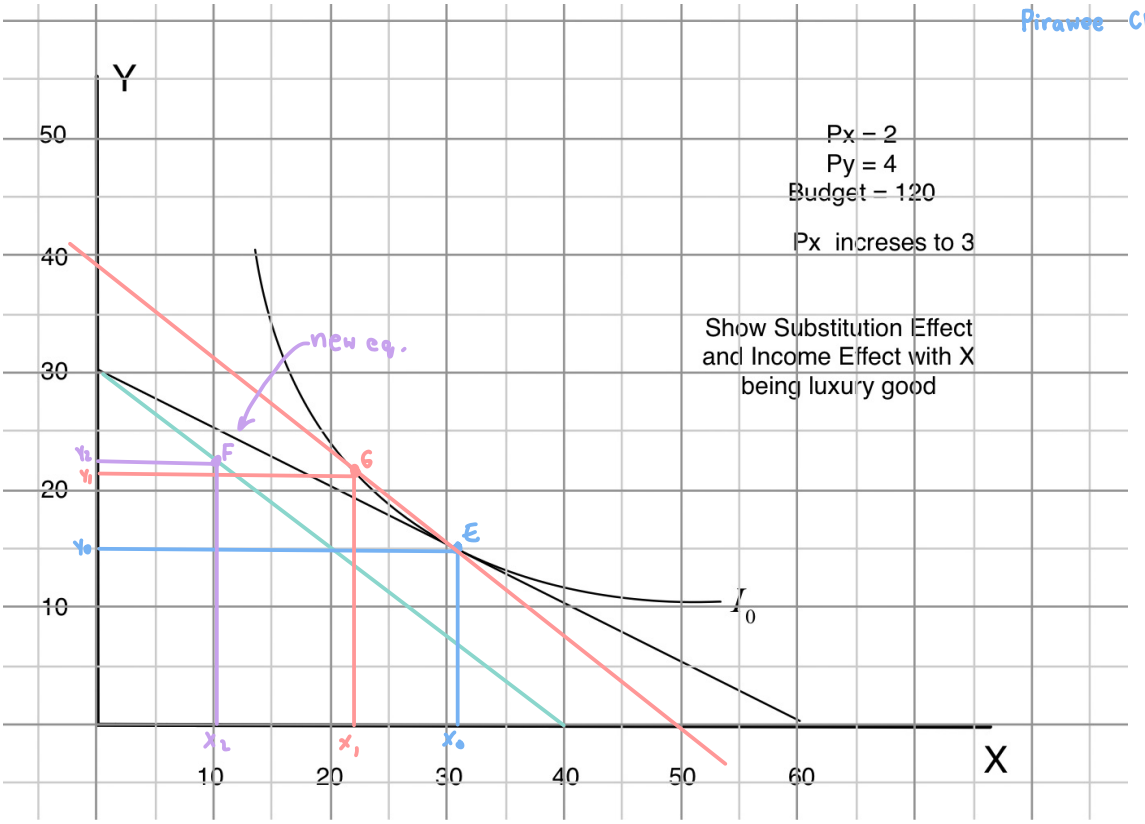

$P_x = 2$, $P_y = 4$, Budget $= 120$

$2X + 4y = 120$ if $y=0$, $X=60$

$X=0$, $y=30$

P_x ↑ to 3 $3X + 4y = 120$ if $y=0$, $X=40$

$X=0$, $y=30$

S.E. $= \begin{cases} \Delta X = X_1 - X_0 = 22 - 31 = -9 < 0 \\ \Delta Y = Y_1 - Y_0 = 21 - 15 = 6 > 0 \end{cases}$

I.E. $= \begin{cases} \Delta X = X_2 - X_1 = 10 - 22 = -12 < 0 \\ \Delta Y = Y_2 - Y_1 = 23 - 21 = 2 > 0 \end{cases}$

T.E. $= \begin{cases} \Delta X = X_2 - X_0 = 10 - 31 = -21 < 0 \\ \Delta Y = Y_2 - Y_0 = 23 - 15 = 8 > 0 \end{cases}$

∴ P_x increase → consume less x, more y

x and y are subsitute good

Less real income → consume less x, more y

x is luxury good, y is inferior good.