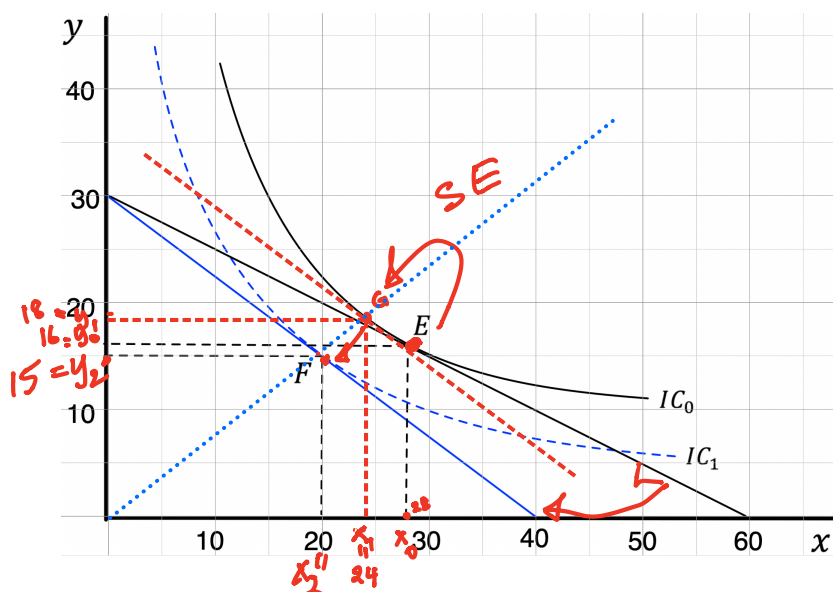


Chapter 14.a Substitution and Income Effects

2. p_x increases from $p_x = 2$ to $p'_x = 3$.



- The equilibrium point changes from $E = (x_0, y_0)$ to $F = (x_2, y_2)$. In this case, when p_x increases, the consumer buys less of y . This means x and y are complementary.
- The relative price changes from $\frac{p_x}{p_y} = \frac{2}{4}$ to $\frac{p'_x}{p_y} = \frac{3}{4}$.
- To keep the same satisfaction with the new relative price $\frac{p'_x}{p_y}$ draw an imaginary budget line with slope $\frac{p'_x}{p_y}$ to be tangent with the original Indifference Curve IC_0 .
- The Substitution Effect is:

$$S.E. = \begin{cases} \Delta x = x_1 - x_0 = 24 - 28 = -4 < 0 \\ \Delta y = y_1 - y_0 = 18 - 16 = 2 > 0 \end{cases}$$

- When price changes in such a way that x is relatively more expensive, the Substitution Effect is always such that $\Delta x < 0$ and $\Delta y > 0$.
- Income Effect can be found by moving the imaginary budget line to be tangent with the new budget line.

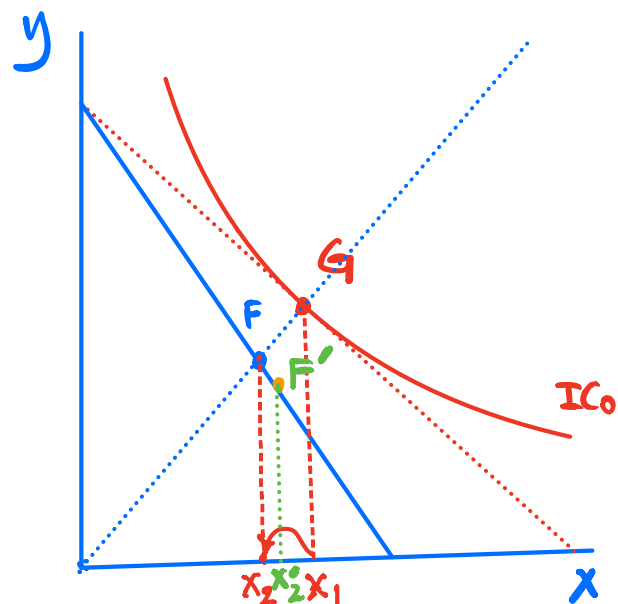
Lower real income

$$I.E. = \begin{cases} \Delta x = x_2 - x_1 = 20 - 24 = -4 < 0 \\ \Delta y = y_2 - y_1 = 15 - 18 = -3 < 0 \end{cases}$$

- According to the resulting $I.E.$, x and y are normal goods because as the real income decreases, the consumer consumes less of both x and y .
- Total Effect = $T.E. = S.E. + I.E.$

$$= \begin{cases} \Delta x = (x_1 - x_0) + (x_2 - x_1) = x_2 - x_0 = 20 - 28 = -8 \\ \Delta y = (y_1 - y_0) + (y_2 - y_1) = y_2 - y_0 = 15 - 16 = -1 \end{cases}$$

From G to F , IE in the graph above
we have $\eta_I^x < 1$ - necessary
 $\eta_I^y > 1$ - luxury.



$$G \rightarrow F. \eta_I^x = 1$$

$$\eta_I^y = 1$$

from x_1 to x_2

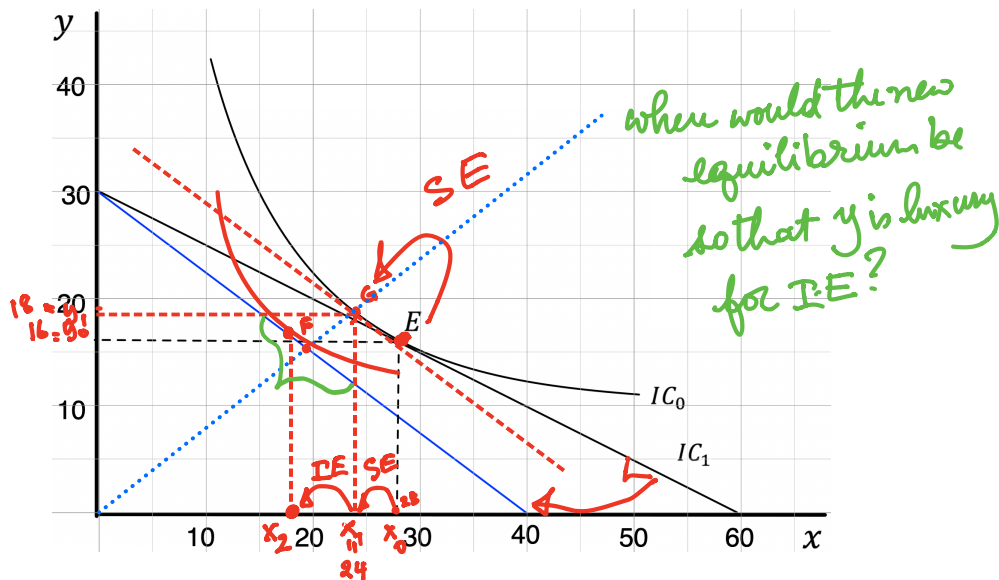
$$\eta_I^x = \frac{\% \Delta x}{\% \Delta I} = 1$$

from x_1 to x'_2

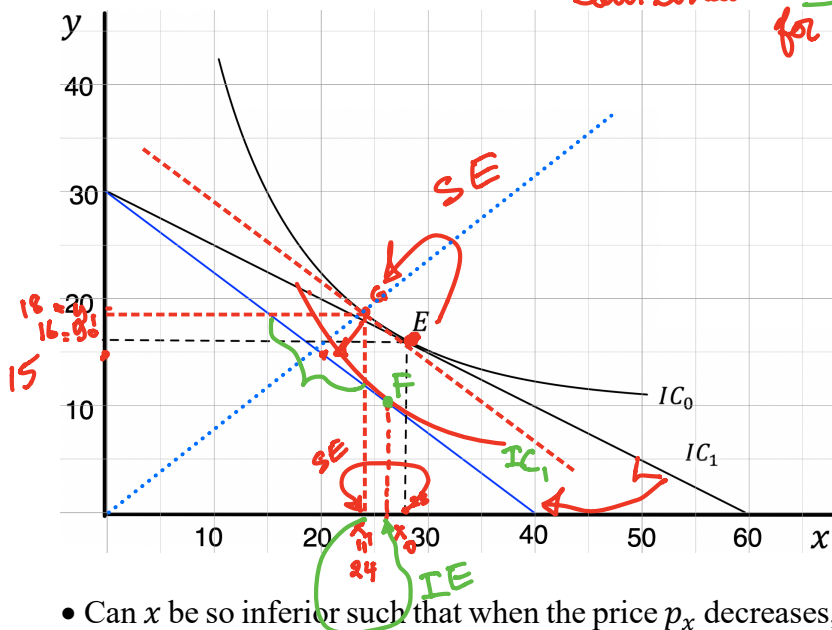
$$\eta_I^x < 1$$

- In the following graphs, draw IC_1 in such a way that x is luxury and inferior.

x is luxury

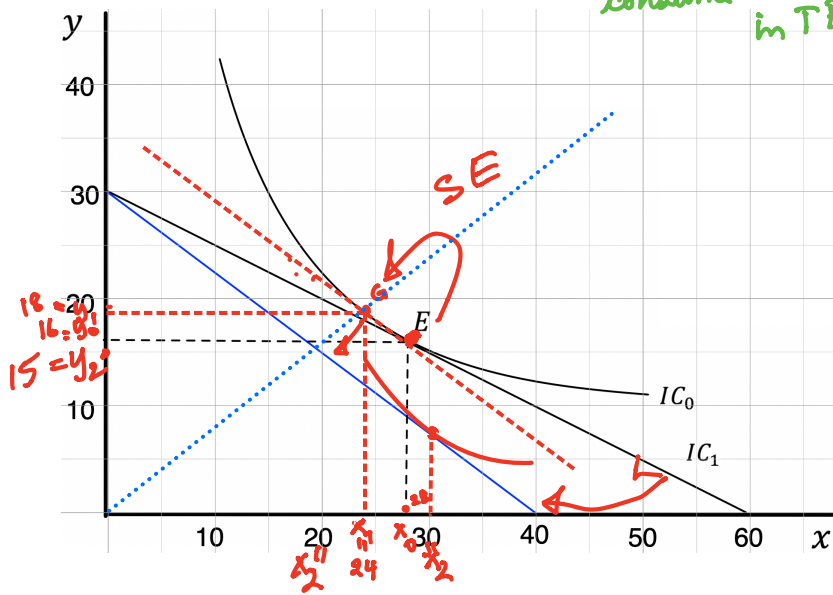


x is inferior — Lower real income but consume more of x for I.E.



- Can x be so inferior such that when the price p_x decreases, the consumer buys less of x ?

x is Giffen good - P_x increases but
consume more x
in TE



- This means that when price p_x increases, the consumer ends up buying more of x . Thus, this violates the Law of Demand even when the consumer is being rational.

