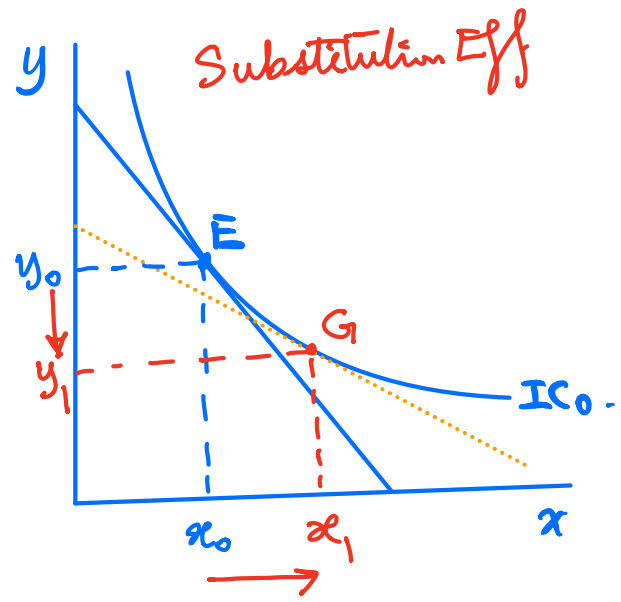


- The equilibrium point changes from $E = (x_0, y_0)$ to $F = (x_2, y_2)$. In this case, when p_x decreases, the consumer buys more of y . This means x and y are complementary.
- The relative price changes from $\frac{p_x}{p_y} =$ to $\frac{p'_x}{p_y} =$
- To keep the same satisfaction with the new relative 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:



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

$\begin{matrix} 24 & 20 \\ 13 & 15 \end{matrix}$

- When price changes in such a way that x is relatively less expensive, the Substitution Effect is always such that $\Delta x > 0$ and $\Delta y < 0$. Why? — *Diminishing MRS assumptions.*
- Income Effect can be found by moving the imaginary budget line to be tangent with the new budget line. — *and tangent to higher IC at IC_1 on top of*

$$I.E. = \begin{cases} \Delta x = x_2 - x_1 = 28 - 24 = 4 > 0 \\ \Delta y = y_2 - y_1 = 16 - 13 = 3 > 0 \end{cases}$$

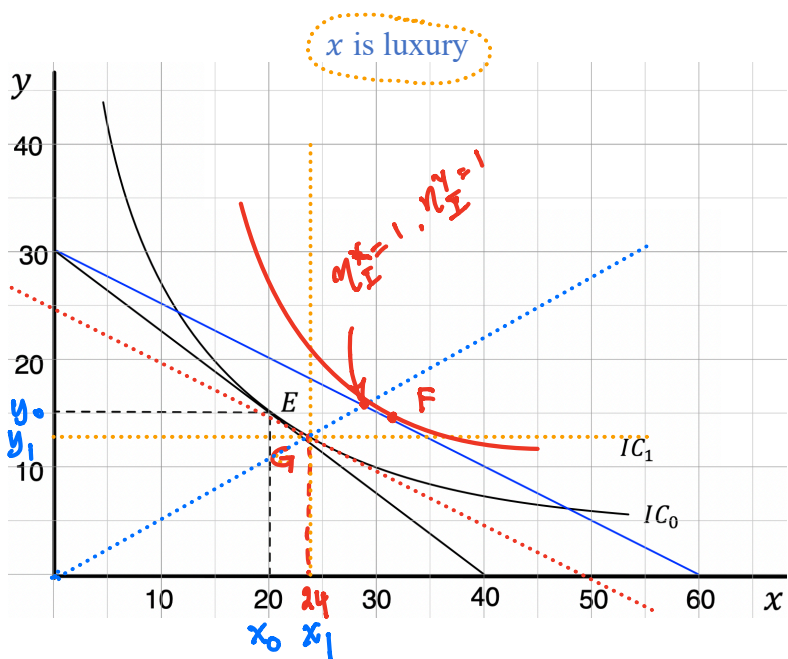
*higher real income
more x + y*

- According to the resulting $I.E.$, x and y are normal goods because as the real income increases, the consumer consumes more of both x and y .

- Total Effect = $T.E. = S.E. + I.E.$

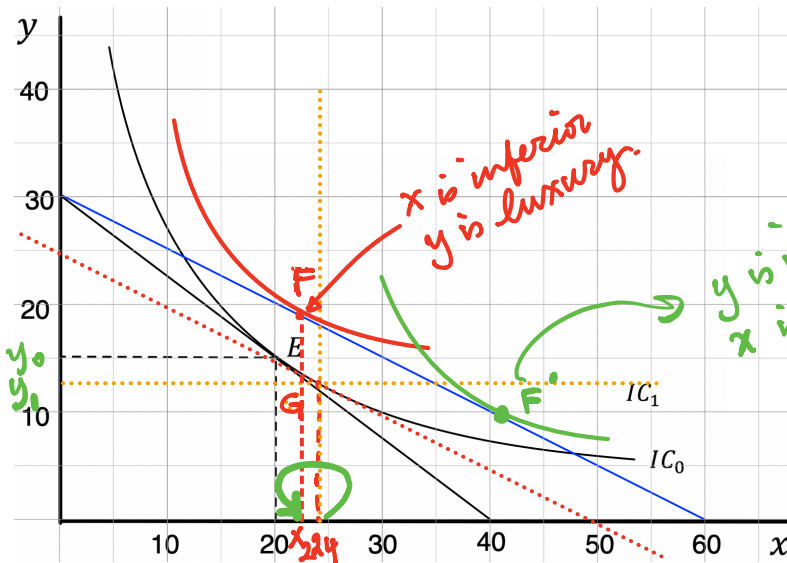
$$= \begin{cases} \Delta x = (x_1 - x_0) + (x_2 - x_1) = x_2 - x_0 \\ \Delta y = (y_1 - y_0) + (y_2 - y_1) = y_2 - y_0 \end{cases}$$

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

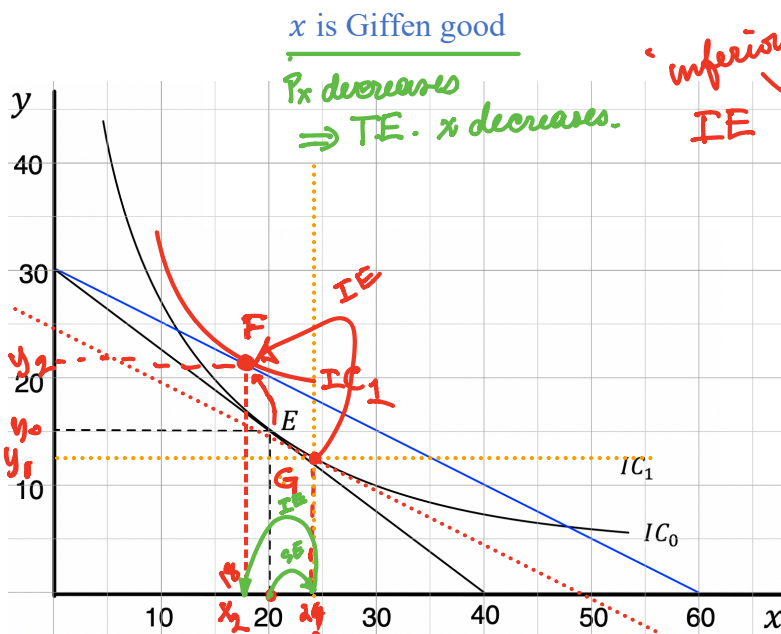


$E \rightarrow G \Rightarrow SE$

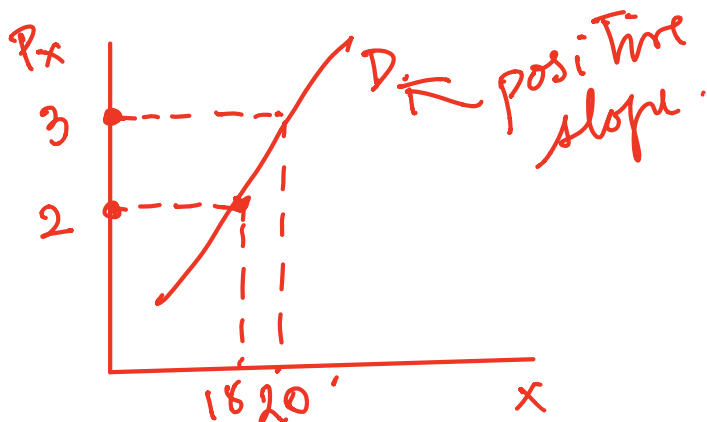
x is inferior P_x decreases, consume less of x for I.E.



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



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



120
180 - 20 = 96
84

P_x decreases.
 y is inferior!

y is inferior
 x is luxury.

x is Giffen.

TE: $\Delta x = x_2 - x_0 = 18 - 20 = -2 < 0$
 $\Delta y = y_2 - y_0 = 21 - 15 = 6 > 0$

inferior
IE: $\Delta x = x_2 - x_1 = 18 - 24 = -6 < 0$

x is so inferior that the reduction in x due to IE overwhelms the increase in x due to the SE.