Today.

- Review consumer's U-max problem
  - → Utility & BC.
    - → (X^*, Y^*).
- Decomposition of income effect and substitution effect. when a price changes.
- Applications:
  1. Giffen
  2. Subsidy
  3. Vouchers
  4. Labour Mkt.
  5. Intertemporal consumption.

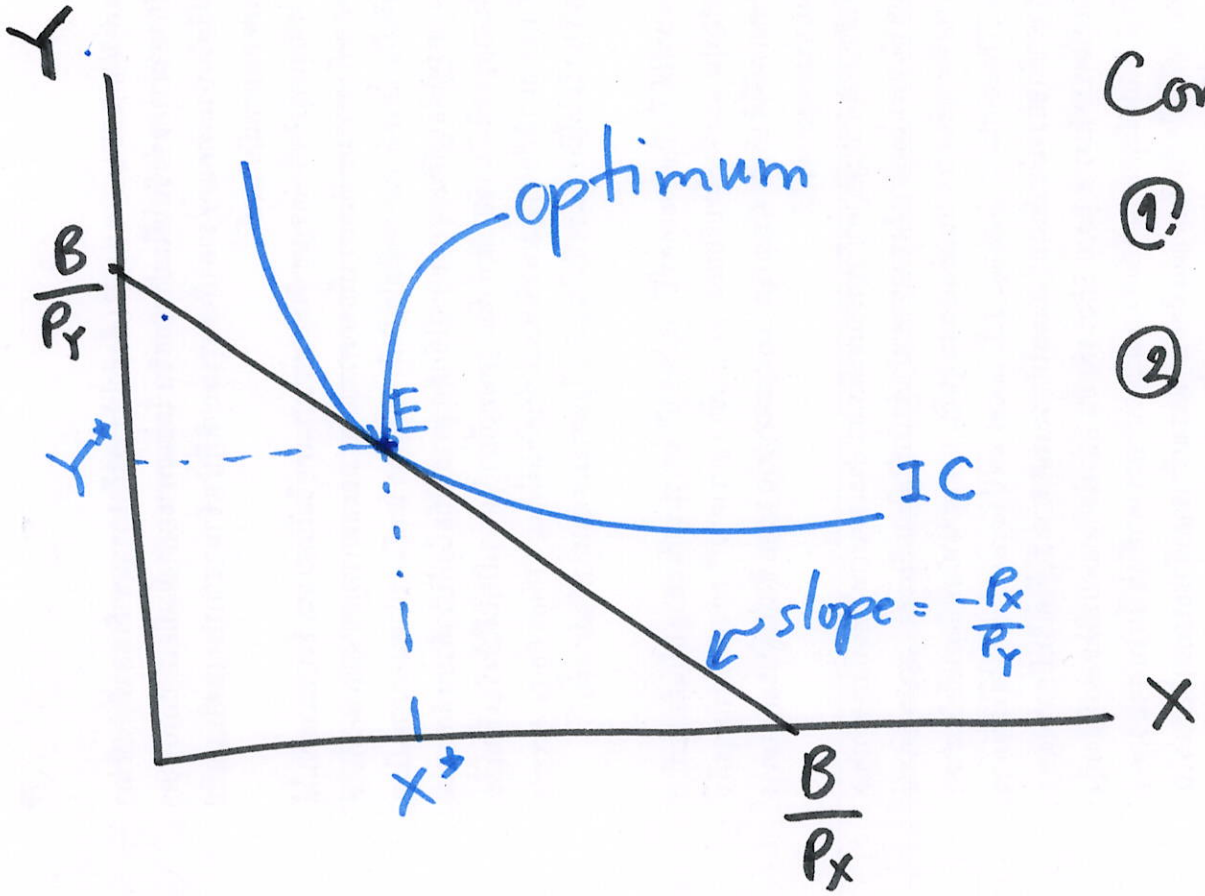
Utility-maximization Problem

Max $U(X, Y)$

s.t. $P_X \cdot X + P_Y \cdot Y = B$ ↙

$P_Y Y = B - P_X X$

$Y = \frac{B}{P_Y} - \frac{P_X}{P_Y} X$



Conditions for U-max:

① $P_X \cdot X^* + P_Y \cdot Y^* = B$

② slope of IC = slope of BC

$|MRS| = \left|\frac{P_X}{P_Y}\right|$

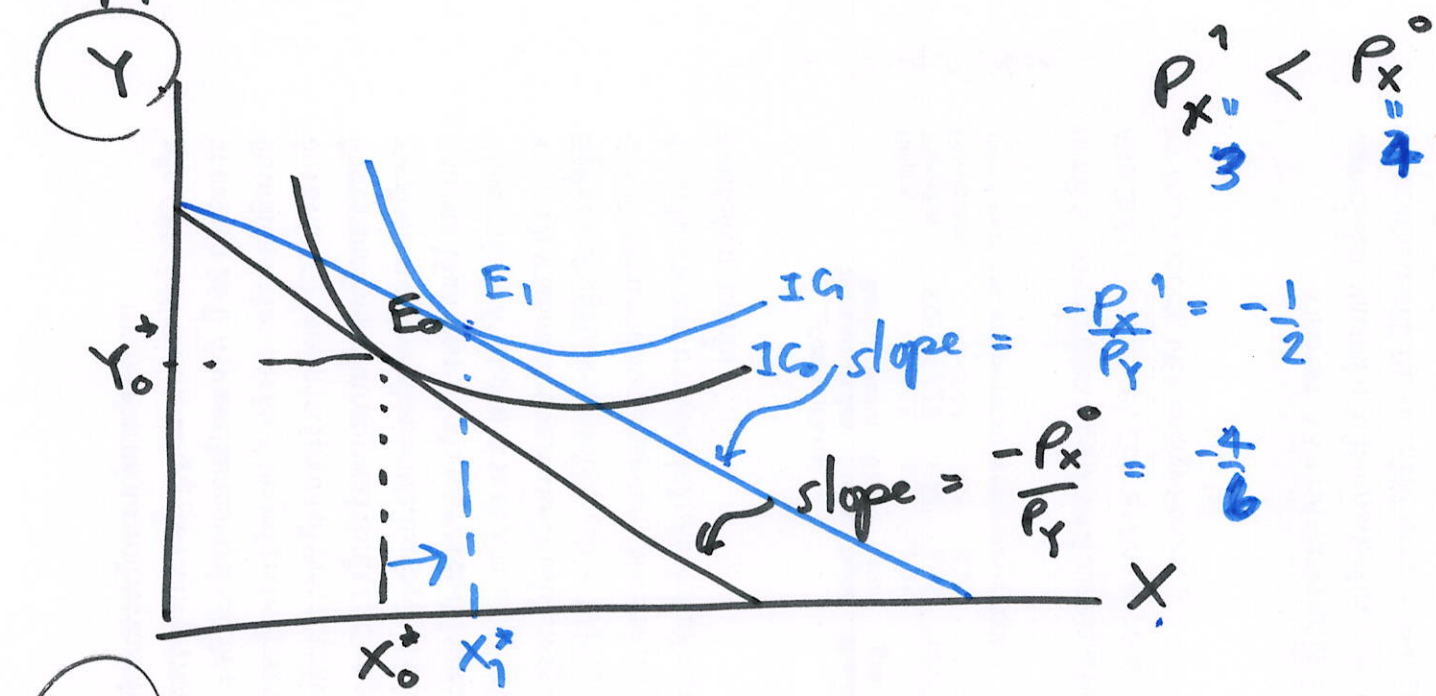
↳ where $MRS = -\frac{MU_X}{MU_Y}$

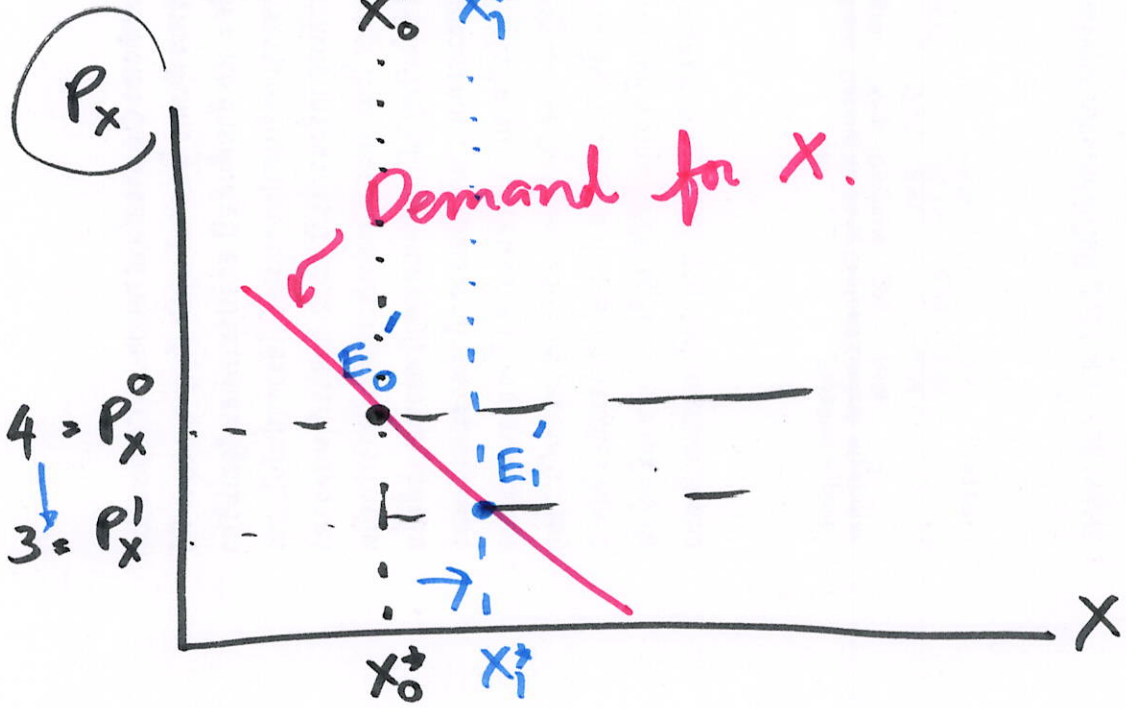
Suppose $P_x \downarrow$, ceteris paribus

Suppose $P_y = 6$

$P_x^1 < P_x^0$

$3 < 4$



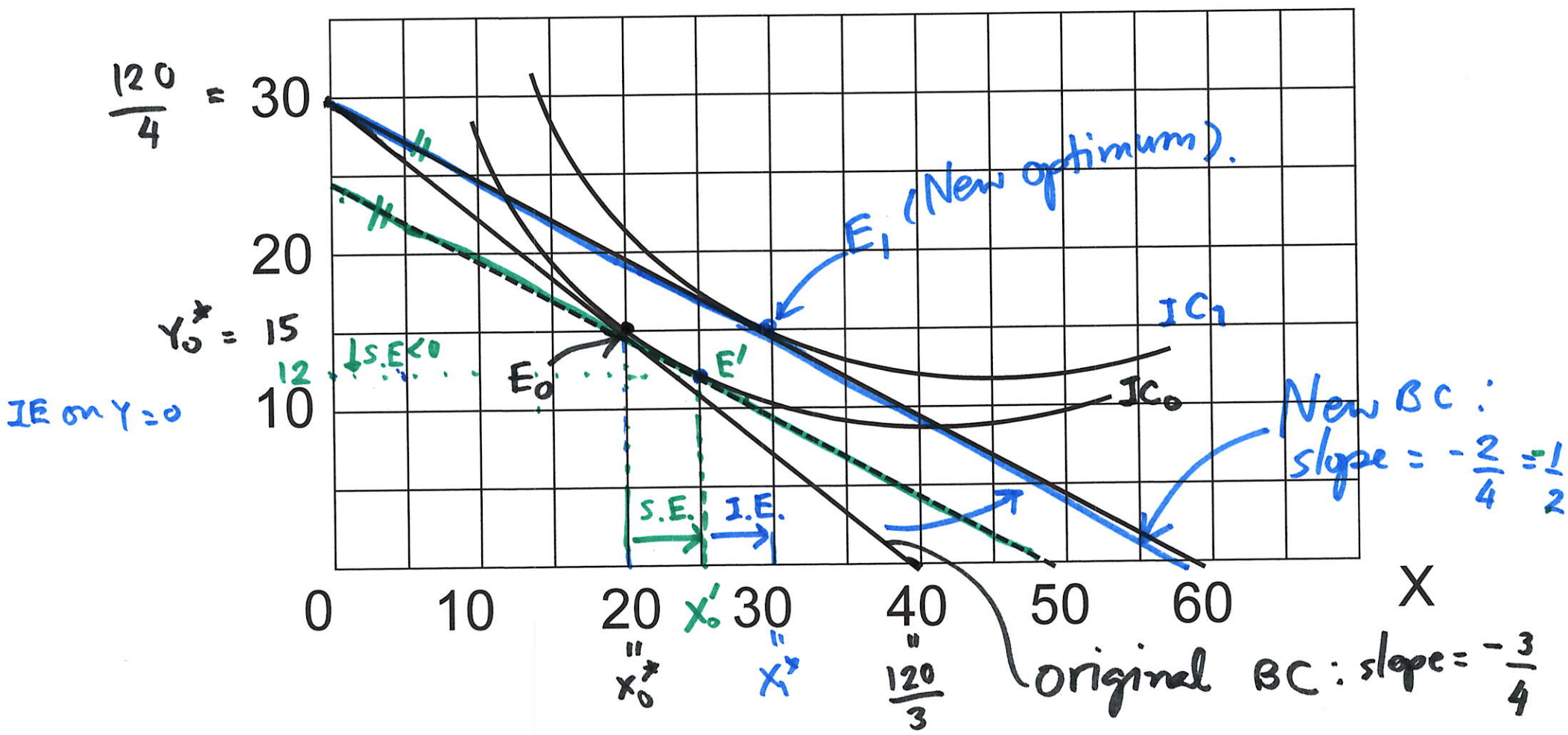


Substitution Effect = $X_0' - X_0^* > 0$
Income effect = $X_1^* - X_0' > 0$

Graph

Original P_x — New P_x

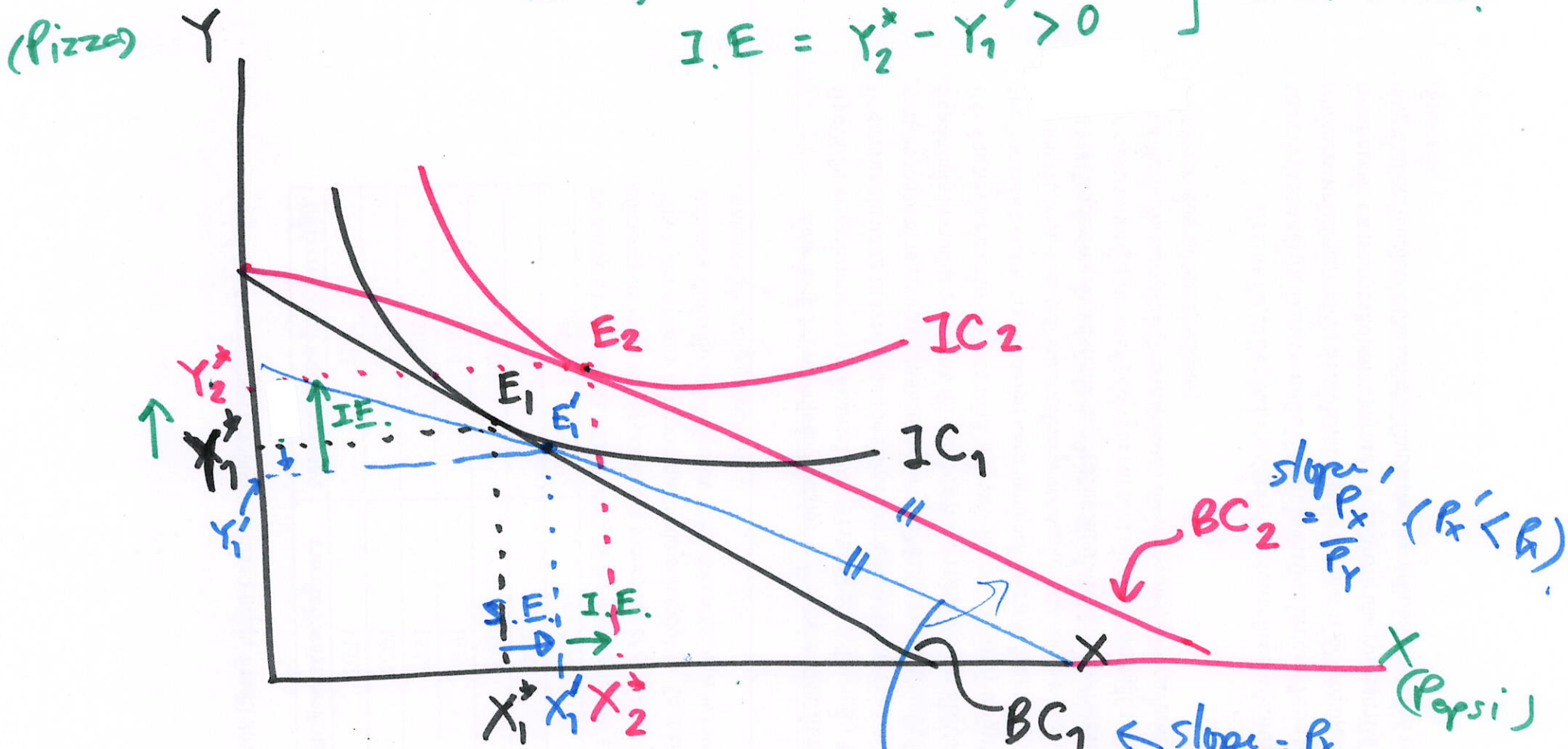
- Suppose Px = $3, P'x = $2, Py = $4, and B = 120.



for Y, S.E. $= Y_1' - Y_1^* < 0$

I.E $= Y_2^* - Y_1' > 0$

} I.E. > S.E.



For X, S.E. $= X_1' - X_1^* > 0$

I.E. $= X_2^* - X_1' > 0$

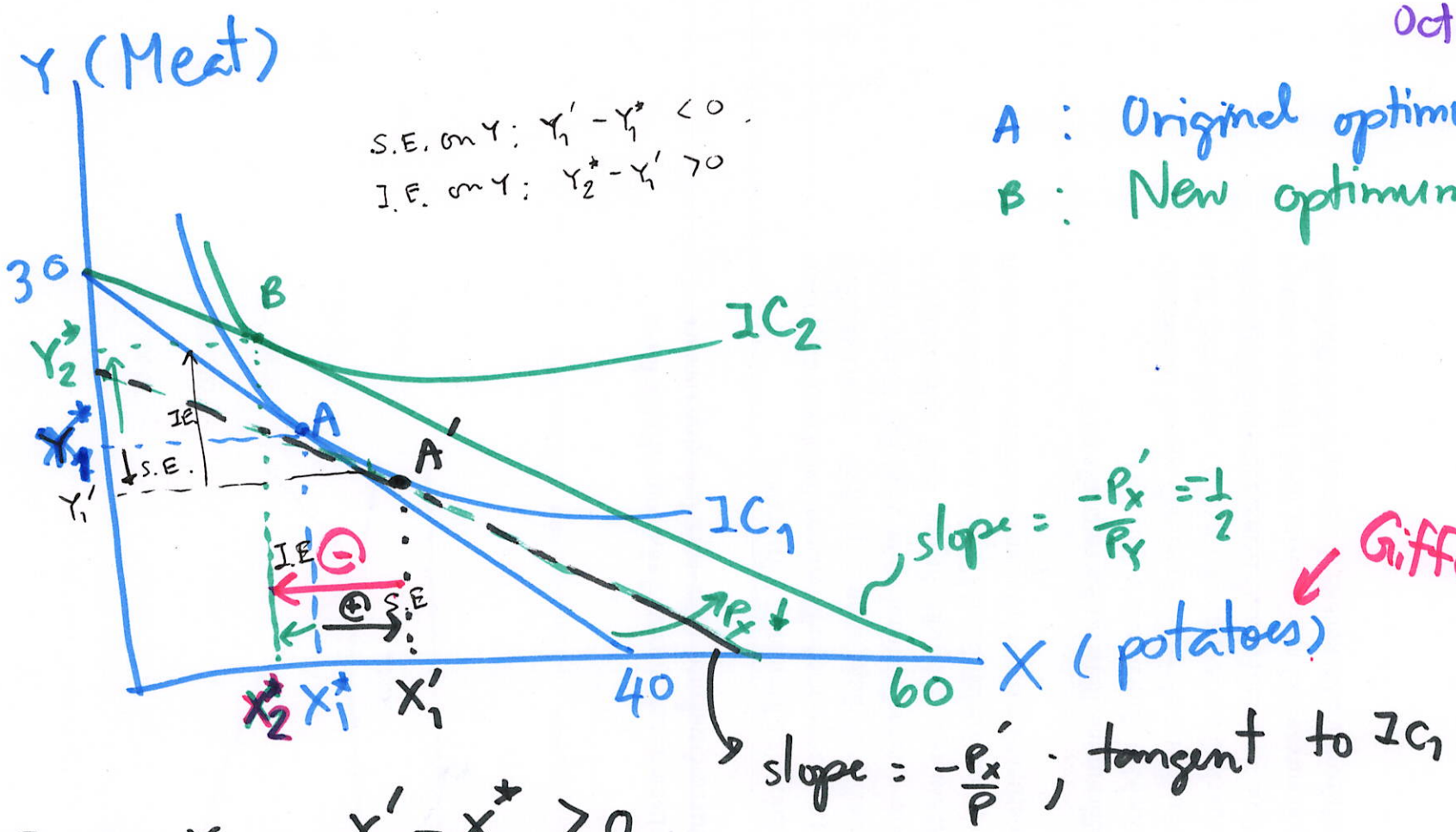
Application : Giffen Good.

- Giffen goods are goods at which quantity demanded decreases when its price is lower.
- Giffen good is a special case of inferior good.
  - Possible when income ⊖ effect is greater than substitution ⊕ effect.

Assume 2 goods: Potatoes (X) & Meat (Y).

Suppose $P_x = 3$, $P_Y = 4$, $B = 120$.

↳ $P_x' = 2$



S.E. on X = $X_1' - X_1^* > 0$

I.E. on X = $X_2^* - X_1' < 0$

Total effect = $X_2^* - X_1^* < 0$ b/c IE > S.E

⊖ ⊕

$P_x \downarrow \Rightarrow X^* \downarrow$.