

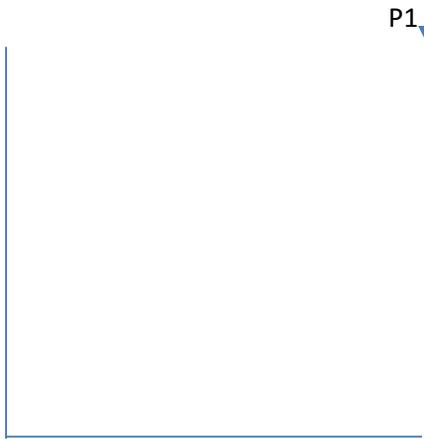
SE/IE Handout

Drawing Substitute Effect $A \rightarrow B$

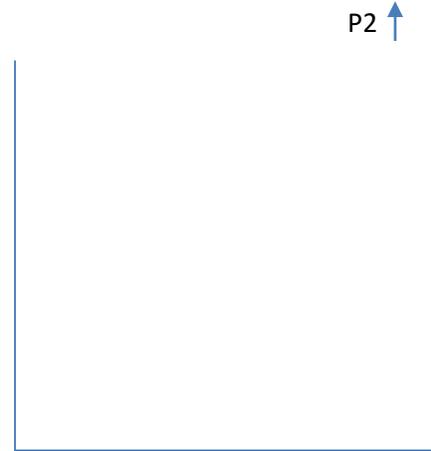
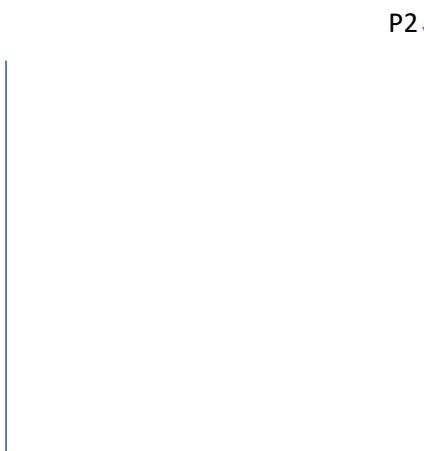
Characteristics of x_1 can be found from the **vertical lines**

Drawing Income Effect $B \rightarrow C$

Characteristics of x_2 can be found from the **horizontal lines**



Try these on your own!



Questions you can use the graphs for may look like:

- What directions do the SE and IE go in if x_1 and x_2 are normal complements?
- Where is C in relation to B if x_1 is inferior and x_2 is normal?
- Draw the SE and IE for an increase in P_1 if x_1 and x_2 are normal substitutes.

Mathematical Substitution effect: B-A

Mathematical Income Effect: C-B

Where A: Original prices and income. This is the $X1^*$ and $X2^*$ if you plug in original prices and original income.

Where C: New prices original income. This is the $X1^*$ and $X2^*$ if you plug in new prices and original income.

Where B: New prices and adjusted income. This is the $X1^*$ and $X2^*$ if you plug in new prices and new income. The new income is designed to keep the consumer on the same IDC despite new prices. (Hicks compensated price change)

1. Find demand for X and Y
2. Find numerical demand for point A and C
3. Find numerical demand for point B.
 - a. To find B, find the utility at point A.
 - b. Plug in the new prices into the demand functions for x and y.
 - c. Plug these demand functions into the utility function, which is set to equal the utility at point A
4. Find SE and IE for X and Y

Find the SE and IE for X and Y for the following:

- | | | | | | |
|-------------------------|-----------|---------|---------|--------|-----------------|
| 1. xy | Original: | $p_x=2$ | $p_y=2$ | $m=12$ | Change: $p_y=3$ |
| 2. $2x + 3y$ | Original: | $p_x=3$ | $p_y=3$ | $m=30$ | Change: $p_x=1$ |
| 3. $\text{Min}(2x, 4y)$ | Original: | $p_x=2$ | $p_y=4$ | $m=24$ | Change: $p_x=4$ |
| 4. $\text{Max}(x, 4y)$ | Original: | $p_x=3$ | $p_y=4$ | $m=12$ | Change: $p_y=6$ |
| 5. $2x + y^{1/2}$ | Original: | $p_x=3$ | $p_y=1$ | $m=30$ | Change: $p_x=1$ |
| 6. $x^2 + 5y$ | Original: | $p_x=2$ | $p_y=2$ | $m=20$ | Change: $p_x=4$ |