

Intermediate Micro Consumer Theory

Challenging Problems:

1. In a two good world, can both X and Y be inferior goods?

(Answer: No. As income increases, if the consumption of both X and Y falls, then the consumer would not be spending all of his or her income and could not be maximizing utility subject to the budget constraint. Therefore, in a two-good world, one good must be normal so that when income rises, the consumer can purchase more of that good.)

2. Calculate the income and substitution effects for the following case:

$$\begin{array}{lll} U(X,Y) = XY & MU_X = Y & MU_Y = X \\ I = \$40 & P_X = \$2 & P_Y = \$1 \end{array}$$

Then let $P_X = \$1$.

(Answer: Initially, $X^*=10$ and $Y^*=20$. This is point A. To find point B, you need to hold utility constant at the same level as point A. So, you need to find U at point A. Since $U = XY$, $U = 200$ at point A. Now you know that $U = 200$, but $P_X = \$1$. Now $MU_X/MU_Y = Y/X = 1$ so $X = Y$. Substitute $X = Y$ into $200 = XY$. $200 = X^2$, so $X =$ the square root of 200 or 14.14. $X_B = 14.14$ and $Y_B = 14.14$. To find point C, just use the new price of X in the optimization problem. $X^{**} = 20$ and $Y^{**} = 20$.)