

#1 Demonstrate how PCC with varying price P_y , (P_x and Income are fixed) can give us the price elasticity of Y to be equal to, less than, or greater than 1 in absolute value

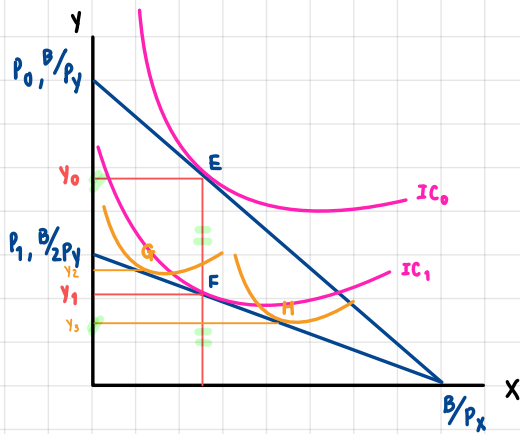
#2

7. A college student has two options for meals: eating at the dining hall for \$6 per meal, or eating a Cup O' Soup for \$1.50 per meal. Her weekly food budget is \$60.
- Draw the budget constraint showing the trade-off between dining-hall meals and Cups O' Soup. Assuming that she spends equal amounts on both goods, draw an indifference curve showing the optimum choice. Label the optimum as point A.
 - Suppose the price of a Cup O' Soup now rises to \$2. Using your diagram from [part \(a\)](#), show the consequences of this change in price. Assume that our student now spends only 30 percent of her income on dining-hall meals. Label the new optimum as point B.
 - What happened to the quantity of Cups O' Soup consumed as a result of this price change? What does this result say about the income and substitution effects? Explain.
 - Use points A and B to draw a demand curve for Cup O' Soup. What is this type of good called?

#3

11. Economist George Stigler once wrote that, according to consumer theory, "if consumers do not buy less of a commodity when their incomes rise, they will surely buy less when the price of the commodity rises." Explain this statement using the concepts of income and substitution effects.

#1 Demonstrate how PCC with varying price P_y , (P_x and Income are fixed) can give us the price elasticity of Y to be equal to, less than, or greater than 1 in absolute value



$$|n_y| = \frac{\% \Delta Y}{\% \Delta P_y} = 1 \quad (E \rightarrow F)$$

$$\% \Delta P_y = \frac{\Delta P_y}{P_y} = \frac{P_y}{3/2 P_y} = \frac{2}{3}$$

$$\% \Delta Y = \frac{-Y_0/2}{3/4 Y_0} = -\frac{2}{3}$$

$$\therefore |n_y| = \frac{-2/3}{2/3} = |-1| = 1$$

$$|n_y| = \frac{\% \Delta Y}{\% \Delta P_y} > 1 \quad (E \rightarrow H)$$

$$|n_y| = \frac{\% \Delta Y}{\% \Delta P_y} < 1 \quad (E \rightarrow G)$$

$$\rightarrow P_0 = P_y, P_1 = 2P_y$$

$$\Delta P_y = P_1 - P_0 = 2P_y - P_y = P_y$$

$$\frac{P_1 + P_0}{2} = \frac{3P_y}{2}$$

$$\rightarrow Y_1 = \frac{Y_0}{2}, Y_0$$

$$\Delta Y = Y_1 - Y_0 = \frac{Y_0}{2} - Y_0 = -\frac{Y_0}{2}$$

$$\frac{Y_1 + Y_0}{2} = \frac{Y_0/2 + Y_0}{2} = \frac{3}{4} Y_0$$

7. A college student has two options for meals: eating at the dining hall for \$6 per meal, or eating a Cup O' Soup for \$1.50 per meal. Her weekly food budget is \$60. $6X + 1.5Y = 60$

- a. Draw the budget constraint showing the trade-off between dining-hall meals and Cups O' Soup. Assuming that she spends equal amounts on both goods, draw an indifference curve showing the optimum choice. Label the optimum as point A.

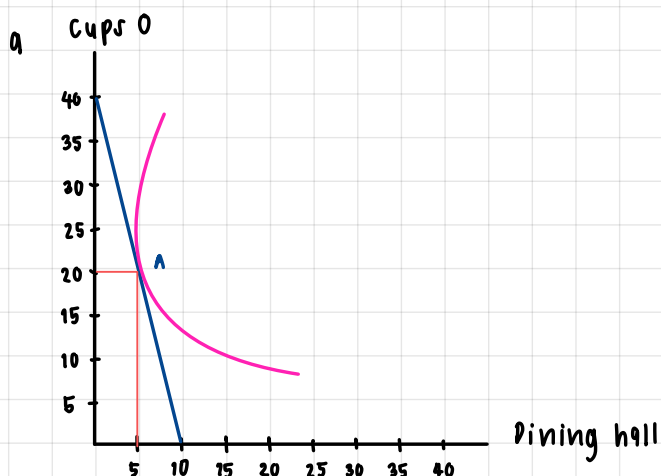
$$1.5Y = 60 - 6X$$

$$Y = -4X + 40$$

$$X = 0; Y = 40$$

$$Y = 0; -40 = -4X$$

$$X = 10$$



→ spend equal

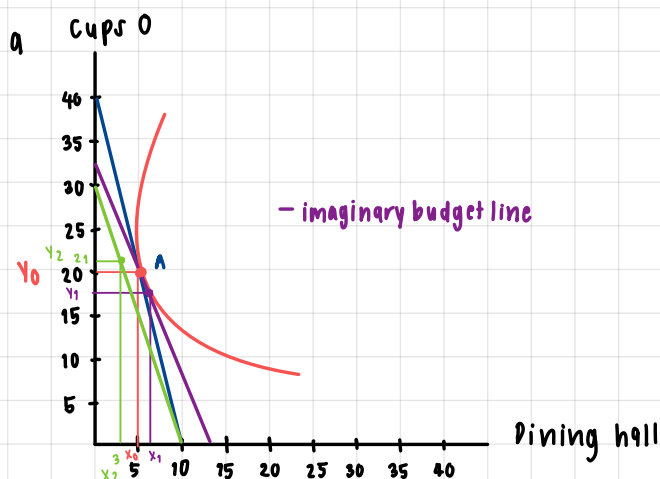
$$6X = \frac{60}{2} \rightarrow 12X = 60$$

$$X = 5$$

$$1.5Y = \frac{60}{2} \rightarrow 1.5Y = 30$$

$$Y = 20$$

- b. Suppose the price of a Cup O' Soup now rises to \$2. Using your diagram from [part \(a\)](#), show the consequences of this change in price. Assume that our student now spends only 30 percent of her income on dining-hall meals. Label the new optimum as point B.



$$\begin{aligned} 6X + 2Y &= 60 \\ 2Y &= -6X + 60 \\ Y &= -3X + 30 \end{aligned} \quad \begin{aligned} X &= 0; Y = 30 \\ Y &= 0; -30 = -3X \\ X &= 10 \end{aligned}$$

Spending: 30% on X
70% on Y

$$\begin{aligned} \$60 \times \frac{30}{100} &= \$18, & \$60 \times \frac{70}{100} &= \$42 \\ \$6X &= \$18, & \$2Y &= \$42 \\ X &= \$3, & Y &= \$21 \end{aligned}$$

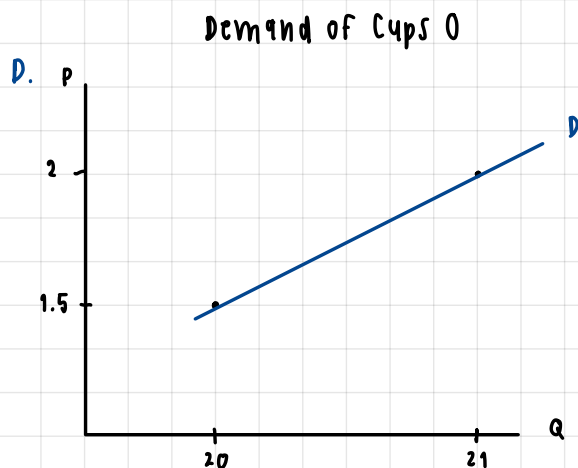
- c. What happened to the quantity of Cup O' Soup consumed as a result of this price change? What does this result say about the income and substitution effects? Explain.
- d. Use points A and B to draw a demand curve for Cup O' Soup. What is this type of good called?

c. The result of price change $\Rightarrow$ consumption of Cup O increased by 1

The result of substitution effect: S.E. $\Delta X = X_1 - X_0 = 5.5 - 5 = 0.5 > 0$ — more x, less y (qs always)
 $\Delta Y = Y_1 - Y_0 = 18 - 20 = -2 < 0$

The result of income effect: I.E. $\Delta X = X_2 - X_1 = 3 - 5.5 = -2.5 < 0$ — consume less x, more y
 $\Delta Y = Y_2 - Y_1 = 21 - 18 = 3 > 0$

Total effect = T.E. = S.E. + I.E.: T.E. $\Delta X = (X_1 - X_0) + (X_2 - X_1) = 0.5 - 2.5 = -2 < 0$ — consume less x, more y
 $\Delta Y = (Y_1 - Y_0) + (Y_2 - Y_1) = -2 + 3 = 1 > 0$ when real income $\downarrow$



$$\begin{aligned} (Q, P) \\ \text{old: } (20, 1.5) \\ \text{new: } (21, 2) \end{aligned}$$

$\therefore$ Demand curve = positive slope
(violate law of demand)
 $\rightarrow$ it must be Giffen good.

11. Economist George Stigler once wrote that, according to consumer theory, "if consumers do not buy less of a commodity when their incomes rise, they will surely buy less when the price of the commodity rises." Explain this statement using the concepts of income and substitution effects.

When consumers do not buy less of a commodity when their income $\uparrow$

→ considered as : normal goods

substitution and income would $\downarrow$ the consumption when normal goods' price $\uparrow$

substitution effect : makes consumers buy $\downarrow$

because it looks more expensive.

price $\uparrow$: less power to buy for consumer

$\therefore$ S.E. and I.E. : price $\uparrow$ affects consumers to buy less.