1 Slutsky Decomposition from old exam.

$$x_1 = \frac{m}{p_1 + p_2}, x_2 = \frac{m}{p_1 + p_2}$$

$p_1 = 1, p_2 = 1, m = 30$

Price 1 chages:

$p_1 = 2$

Decompose the change in demand for x_1 into substitution and income effect.

What is the total change in demand?

Before the price change. $x_1 = \frac{30}{1+1} = 15$,$x_2 = \frac{30}{1+1} = 15$

After the price change. $x_1 = \frac{30}{2+1} = 10$,$x_2 = \frac{30}{2+1} = 10$

Demand decreased by 5.

How much is due to the substitution effect?

What income would the consumer need to buy the old bundle $(15, 15)$ at the new prices?

$$2 * 15 + 1 * 15 = 3 * 15 = 45$$

Would need $m = 45$.

If we calculate demand at the new prices with this extra income and change cannot come from the **income effect**. We wiped out the income effect with the extra income.

$$x_1 = \frac{45}{2 + 1} = \frac{45}{3} = 15$$

The difference between what they bought originall and what they buy here **is the substitution effect**.

SE=0

Remaining effect is the income effect.

$$TE = SE + IE$$

$$5 = 0 + IE$$

Income effect is 5.

Budget Line:

$$p_1x_1 + p_2x_2 = m$$

Slope of the budget line:

$$-\frac{p_1}{p_2}$$

Slope of the budget tells us how much x_2 you have to give up if you want one more unit of x_1.

$$a \succsim a, b \succsim b, c \succsim c, a \succsim b, b \succsim c, c \succsim a$$

a) Is this complete?

b) Why is this not transitive?

$$\succsim, \sim, \succ$$

$a \succ b$ if $a \succsim b$ but not $b \succsim a$

$a \sim b$ if $a \succsim b$ and $b \succsim a$

$$a \succsim a, b \succsim b, c \succsim c, a \succsim b, b \succsim a, a \succsim c, b \succsim c$$

$a \sim a$,$b \sim b, c \sim c, a \sim b$

$a \succ c, b \succ c$

Chain notation. Use only $\succ, \sim$. Put better things on the left.

$$a \sim b \succ c$$

$$\{a, b, c\}$$

Indifference curve is a set of indifference bundles.

The slope (marginal rate of substitution) represents how the consumer trades off between x_2 and x_1 while maintaining the same level of preferences.

how much x_2 would you give up to get one more unit of x_1?

A utility function is a numerical way to represents preferences. $u(x) \geq u(y)$ as long as $x \succsim y$. $u(x) > u(y)$ $x \succ y$. $u(x) = u(y)$ $x \sim y$.

$u(x_1, x_2) = x_1 x_2$

$$u(1,4) = 4, u(4,1)$$

$$(4,1) \sim (1,4)$$

Another bundle on this same indifferene curve requires finding another bundle such that $u(x_1, x_2) = 4$

$$x_1 x_2 = 4$$

$(2,2), (0.5, 8)$

$$MRS = -\frac{MU_1}{MU_2} = -\frac{\frac{\partial(u(x_1,x_2))}{\partial x_1}}{\frac{\partial(u(x_1,x_2))}{\partial x_2}}$$

Monotonicity: More is better than less.

$(x_1, x_2), (y_1, y_2)$

If $x_1 \geq y_1$ and $x_2 \geq y_2$ (at least as much of both)

$$(x_1, x_2) \succsim (y_1, y_2)$$

If $x_1 > y_1$ and $x_2 > y_2$ (at least as much of both)

$$(x_1, x_2) \succ (y_1, y_2)$$