Preferences

- How do consumers choose which bundle in the budget set to consume?
- In the rational choice model, we assume that consumer's are able to rank alternative bundles
- Given the choice between any two bundles, our consumers must be able to say which they'd prefer

Notation

Consumption bundles

$$\left.\begin{array}{ll} & \underbrace{(x_1}_{\text{quantity of good 1}}, \underbrace{x_2)}_{\text{quantity of good 2}} = X \\ \text{or} & (y_1, y_2) = Y \\ \text{or} & (x_1', x_2') = X' \end{array}\right\} \text{big letters mean bundles}$$

- We say that X is strictly preferred to Y if a consumer chooses X over Y when both are available

- $X \succ Y$

this is not a "greater than" sign

- We say that X is <u>indifferent</u> to Y if the consumer doesn't care if they get X or Y

$X \sim Y$

- If a consumer either strictly prefers X to Y or they are indifferent, we write:

$X \succsim Y$ (weak preference)

Relationship between $\succ, \sim, \succsim$

- Suppose $X \succsim Y$ and $Y \succsim X$. Then: $X \sim Y$
- Suppose $X \succsim Y$ and Y is not $\succsim X$. Then: $X \succ Y$
- strict preference and indifference can both be described in terms of $\succsim$

Rationality assumptions

1. Preferences are complete
2. Preference are reflexive
3. Preferences are transtive

1. Completeness

Preferences are complete if for any bundles X and Y

Either:

(a) $X \succ Y$	(a) $X \succsim Y$
(b) $Y \succ X$	(b) $Y \succsim X$
(c) $Y \sim X$	(c) Both

- Consumers can rank any two alternatives

2. Reflexivity

Preferences are reflexive if $X \succsim X$ $(X \sim X)$

- Consumers are indifferent between bundles that are identical to one another

3. Transitivity

Suppose there are 3 bundles X, Y, Z

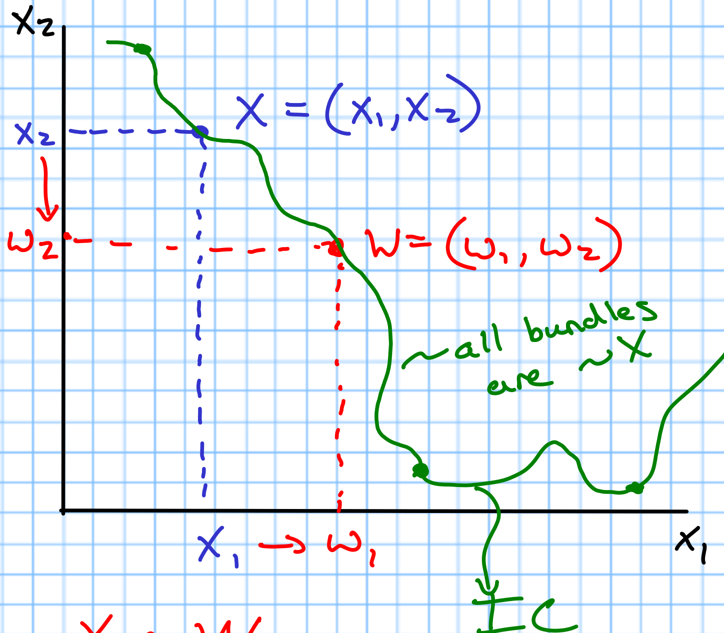
If $X \succ Y$ and $Y \succ Z$

Transitivity means $X \succ Z$

Transitivity means preferences are "consistent"

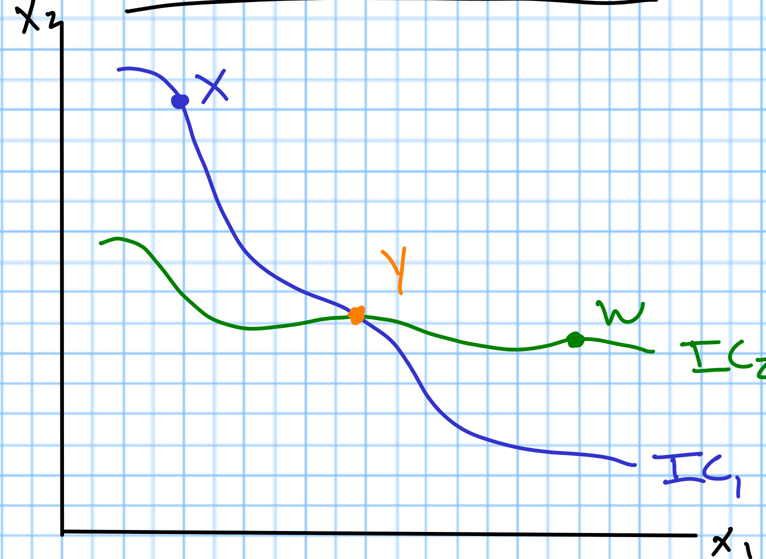
- Money-pump
  Suppose a person's preferences are <u>not</u> transitive
  There's some X, Y, Z such that $X \succ Y$, $Y \succ Z$ and $Z \succ X$
  1. Person has X
     I offer that person a Z in exchange for X and \$0.01
  2. I offer them a Y in exchange for their Z and \$0.01
  3. I offer them an X
  → The person has X just like when we started, but they also lost 3 cents
- We don't observe money pumps in the real world

Indifference curves (IC)



$X \sim W$

Consider 2 different IC for a consumer. Can those ICs intersect?



$X \sim Y$ (on the same IC)

$Y \sim W$ (on the same IC)

$X \nsim W$ (<u>not</u> the same IC)

$\rightarrow$ Either $\underline{X \succ W}$

or $W \succ X$

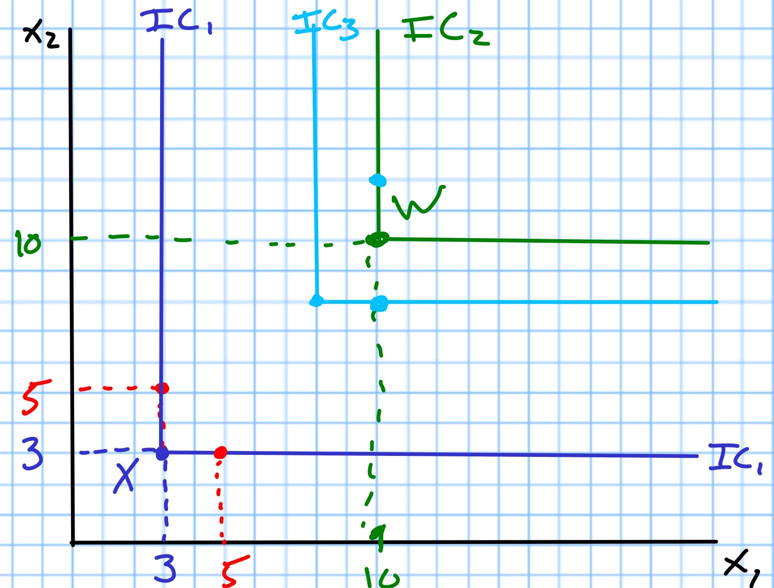
$$\left.\begin{array}{l} X \succ W \\ W \sim Y \\ Y \sim X \end{array}\right\} \text{Transitivity: } X \succ X$$

$\rightarrow$ This violates reflexivity

IC for rational preferences <u>cannot</u> intersect

Example

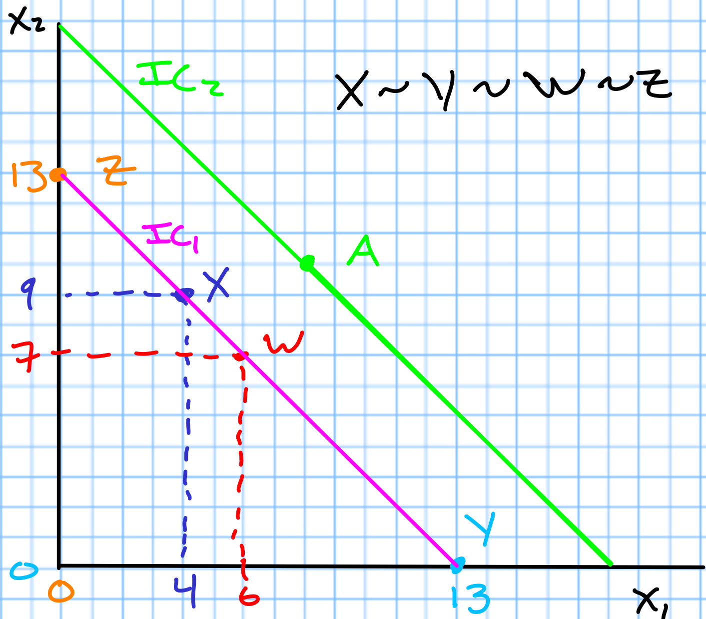
- Perfect complements



(Leontief peferences)

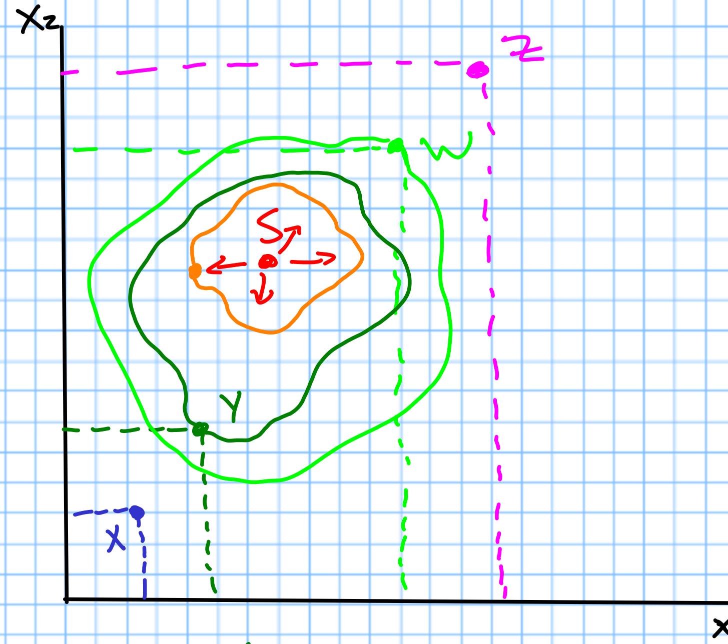
- Perfect substitutes

$X \sim Y \sim W \sim Z$



- Satiation

$S \succ W,\ S \succ Y$



$Y \succ X$

$W \succ Z$

Well-behaved preferences

- Simplifying assumptions that will make the math easier
- Note: None of the main results that we describe depend on these assumptions

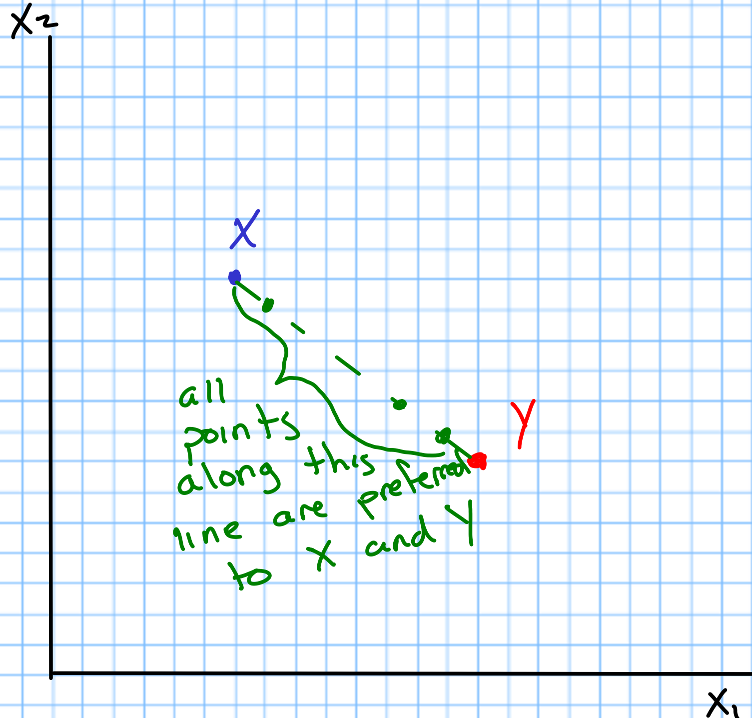
Preferences are <u>well-behaved</u> if:

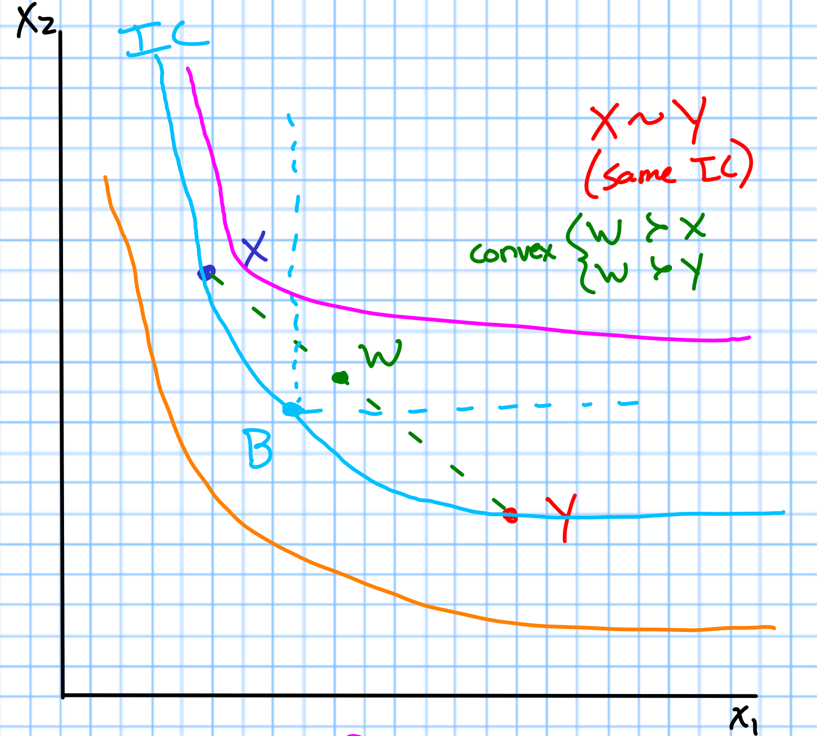
1. Monotonic
2. Convex

1. Preferences are monotonic if a bundle with more of both goods is always preferred over a bundle with fewer goods
   - "More is better"
2. Convexity
   - Mixtures are preferred to extremes

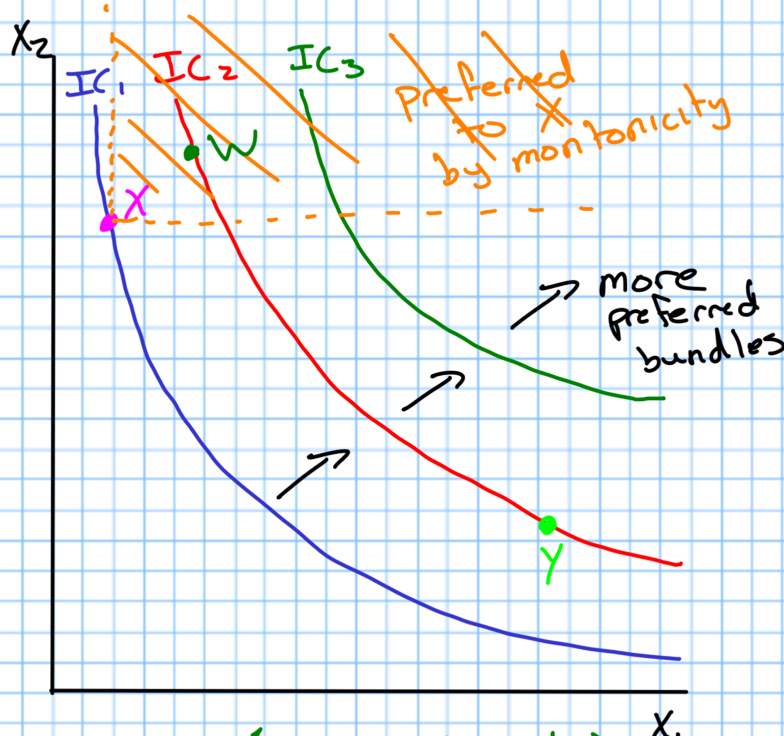
Example: 3 bundles:

$$\left.\begin{aligned} X &= (10, 0) \\ Y &= (0, 10) \\ Z &= (5, 5) \end{aligned}\right\} \quad \begin{aligned} Z &\succ X \\ Z &\succ Y \end{aligned}$$





ICs are for well-behaved preferences

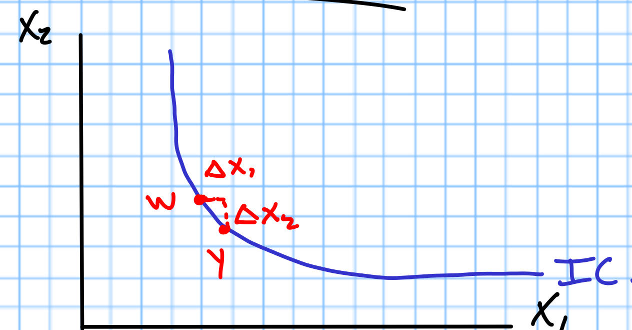


$w \succ x$ (by monotonicity)
$w \sim y$ (same IC)

Transitivity: $y \sim w \succ x$
$\rightarrow y \succ x$

Bundles on IC_2 are preferred on IC_1, and bundles on IC_3 are preferred to bundles on IC_2

Slope of IC

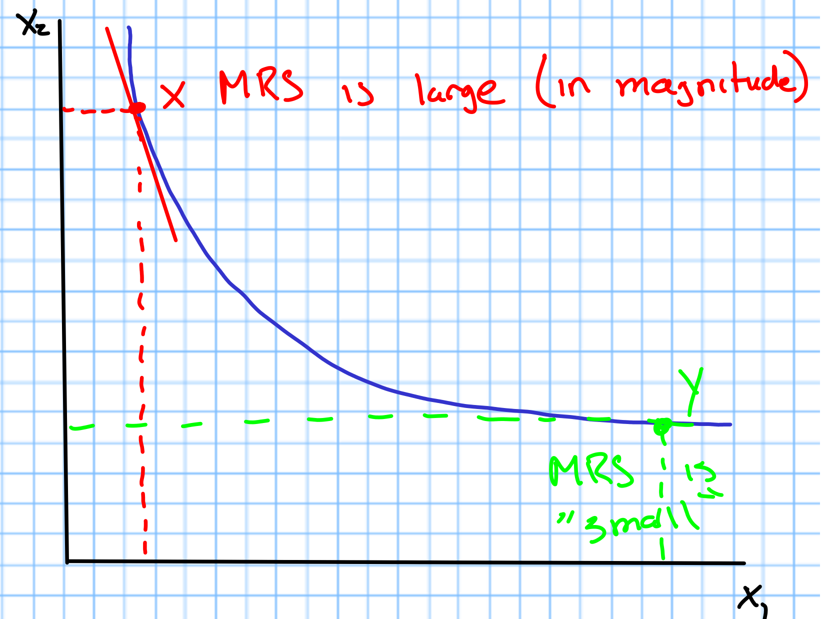


To move from Y to W, we give up some of good 1, but gain some good 2

Slope of IC tells us how much of good 1 we need in order to be just as well off (indifferent) after losing some good 2

- "Willingness to trade"
- "Marginal rate of substitution" (MRS)

- MRS with well-behaved pref.



MRS decreases as x_1 becomes more abundant

→ Diminishing MRS

- Well behaved preferences mean that the consumer has Diminishing MRS