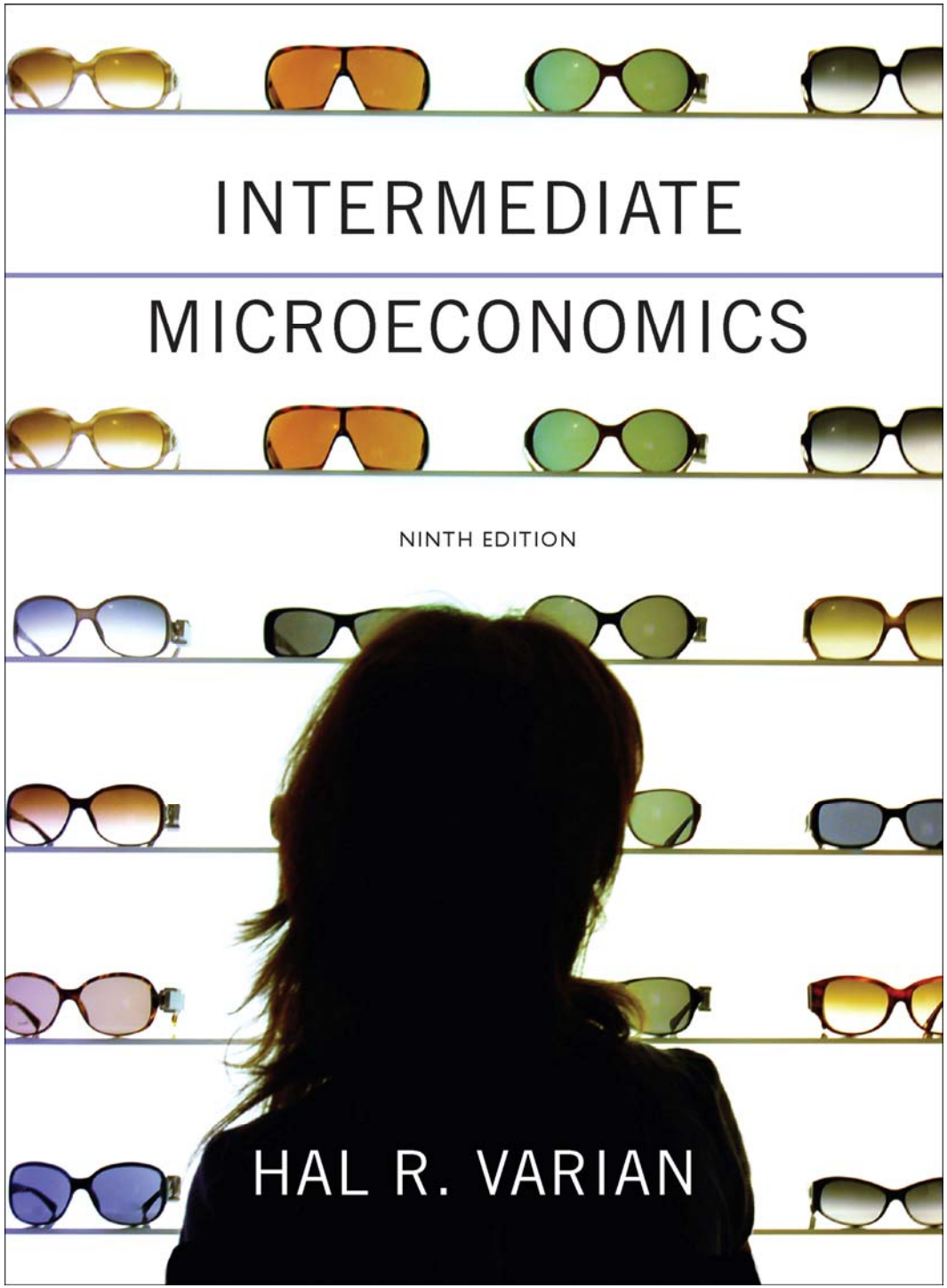


Chapter 3

Preferences

Rationality in Economics

- **Behavioral Postulate:**
  A decisionmaker always chooses its most preferred alternative from its set of available alternatives.
- **So to model choice we must model decisionmakers' preferences.**

Preference Relations

- **Comparing two different consumption bundles, x and y:**
  - **strict preference: x is more preferred than is y.**
  - **weak preference: x is as at least as preferred as is y.**
  - **indifference: x is exactly as preferred as is y.**

Preference Relations

- **Strict preference, weak preference and indifference are all preference relations.**
- **Particularly, they are ordinal relations; *i.e.* they state only the order in which bundles are preferred.**

Preference Relations

- **$\succ$ denotes strict preference;**
  $x \succ y$ means that bundle x is preferred strictly to bundle y.

Preference Relations

- **$\succ$ denotes strict preference; $x \succ y$ means bundle x is preferred strictly to bundle y.**
- **$\sim$ denotes indifference; $x \sim y$ means x and y are equally preferred.**

Preference Relations

- $\succ$ **denotes strict preference so $x \succ y$ means that bundle x is preferred strictly to bundle y.**
- **~ denotes indifference; x ~ y means x and y are equally preferred.**
- $\succsim$ **denotes weak preference; $x \succsim y$ means x is preferred at least as much as is y.**

Preference Relations

- **$x \succsim y$ and $y \succsim x$ imply $x \sim y$.**

Preference Relations

- **$x \succsim y$ and $y \succsim x$ imply $x \sim y$.**
- **$x \succsim y$ and (not $y \succsim x$) imply $x \succ y$.**

Assumptions about Preference Relations

- **Completeness: For any two bundles x and y it is always possible to make the statement that either**

$$x \succsim y$$

or

$$y \succsim x.$$

Assumptions about Preference Relations

- **Reflexivity: Any bundle x is always at least as preferred as itself; *i.e.***

$$x \succeq x.$$

Assumptions about Preference Relations

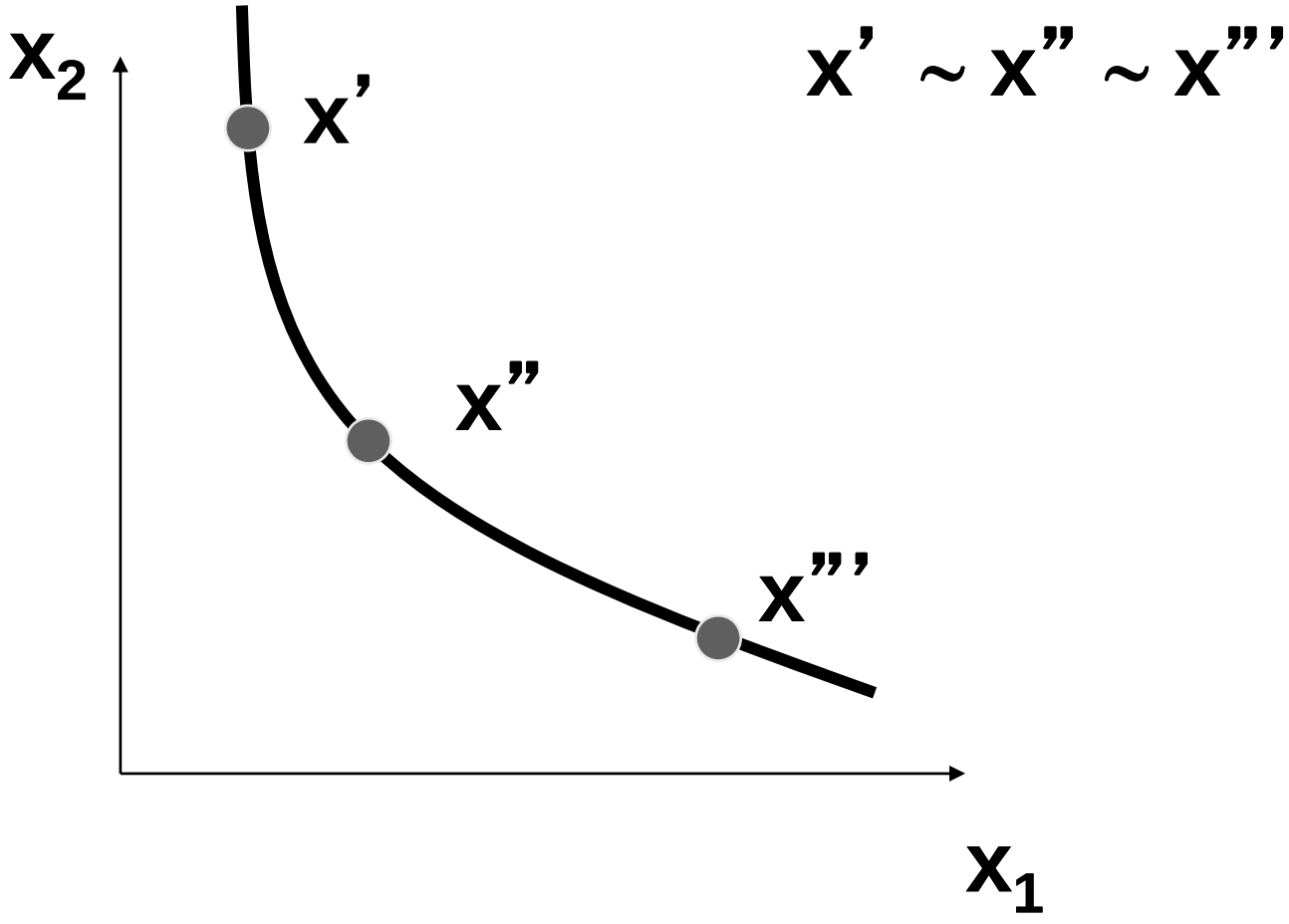
- **Transitivity: If**
  x is at least as preferred as y, and
  y is at least as preferred as z, then
  x is at least as preferred as z; *i.e.*

$$x \succsim y \text{ and } y \succsim z \rightarrow x \succsim z.$$

Indifference Curves

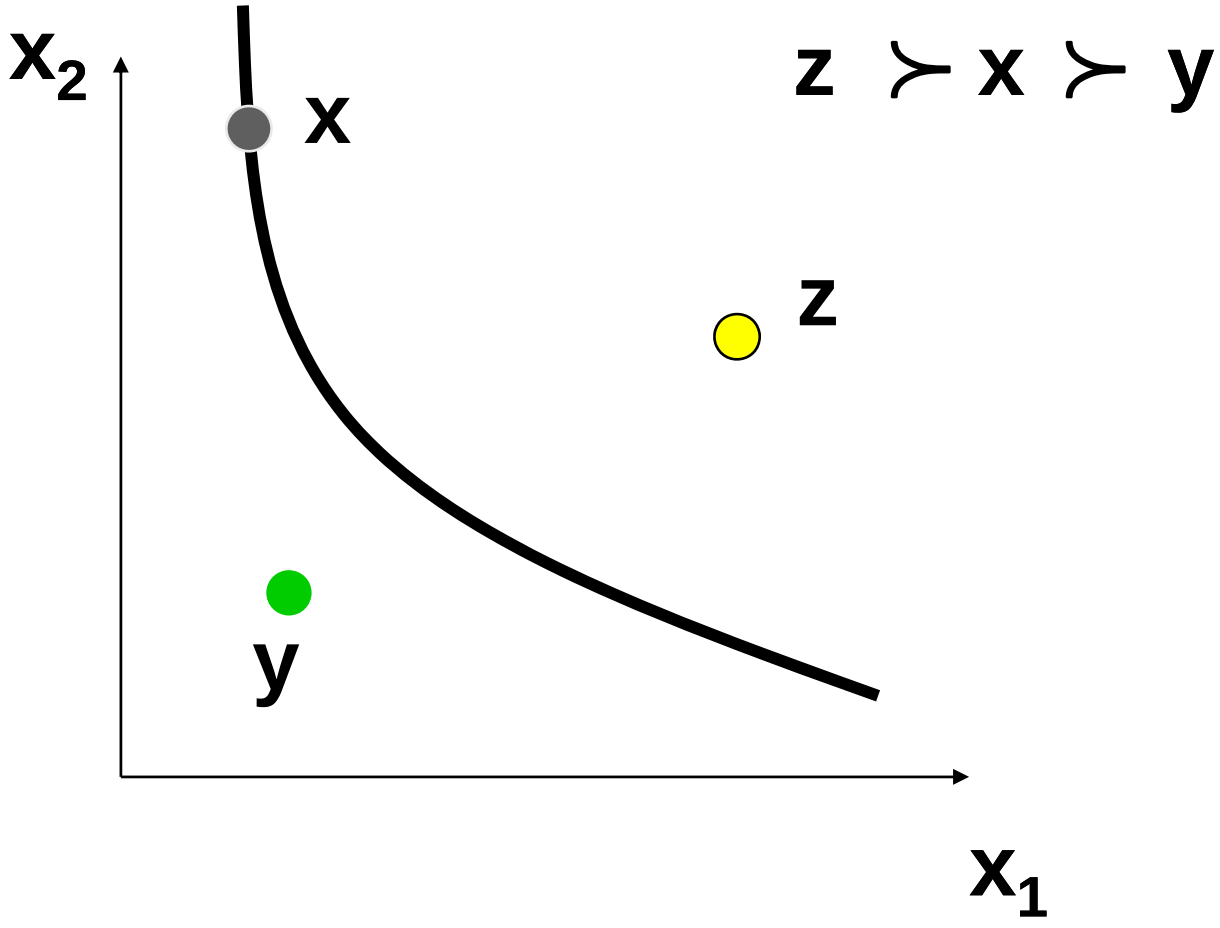
- **Take a reference bundle x′. The set of all bundles equally preferred to x′ is the indifference curve containing x′; the set of all bundles y ~ x′.**
- **Since an indifference "curve" is not always a curve a better name might be an indifference "set".**

Indifference Curves



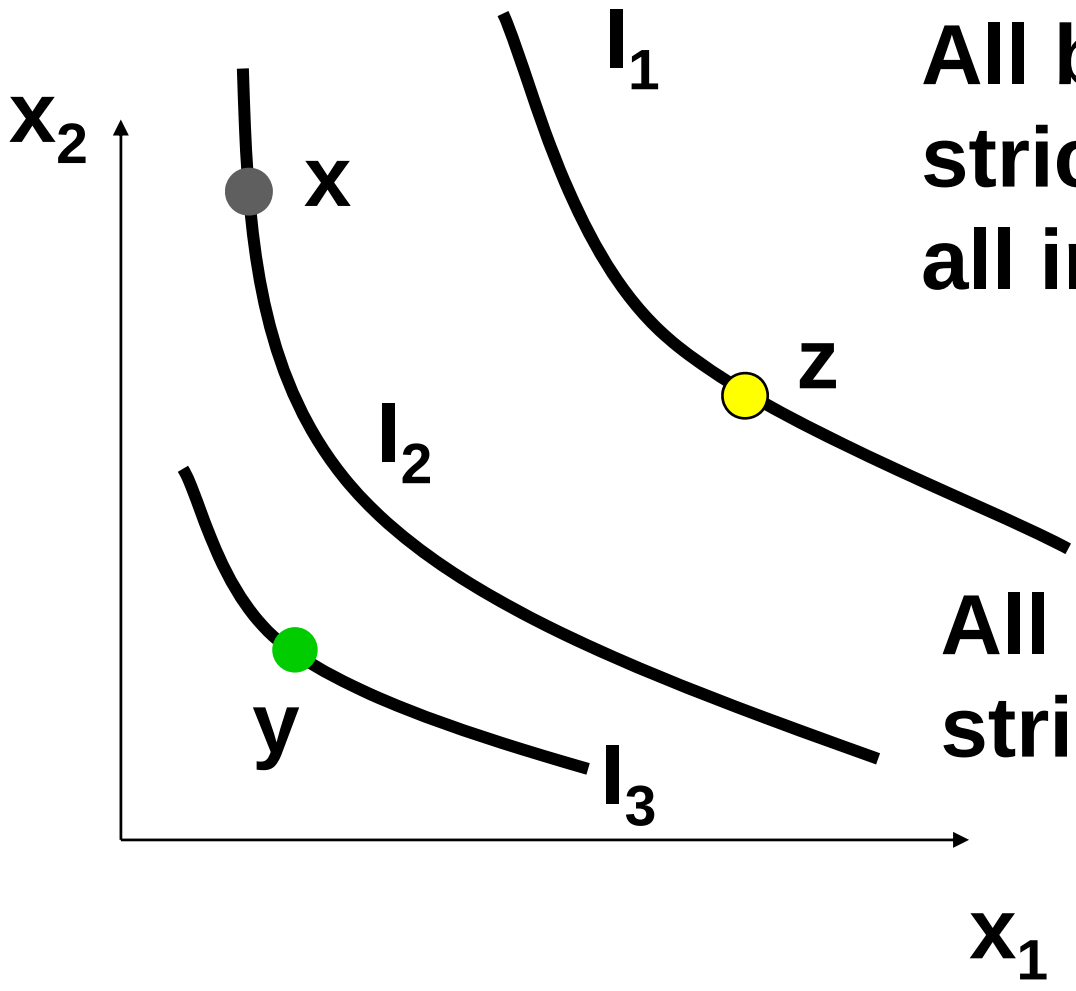
$x' \sim x'' \sim x'''$

Indifference Curves



$z \succ x \succ y$

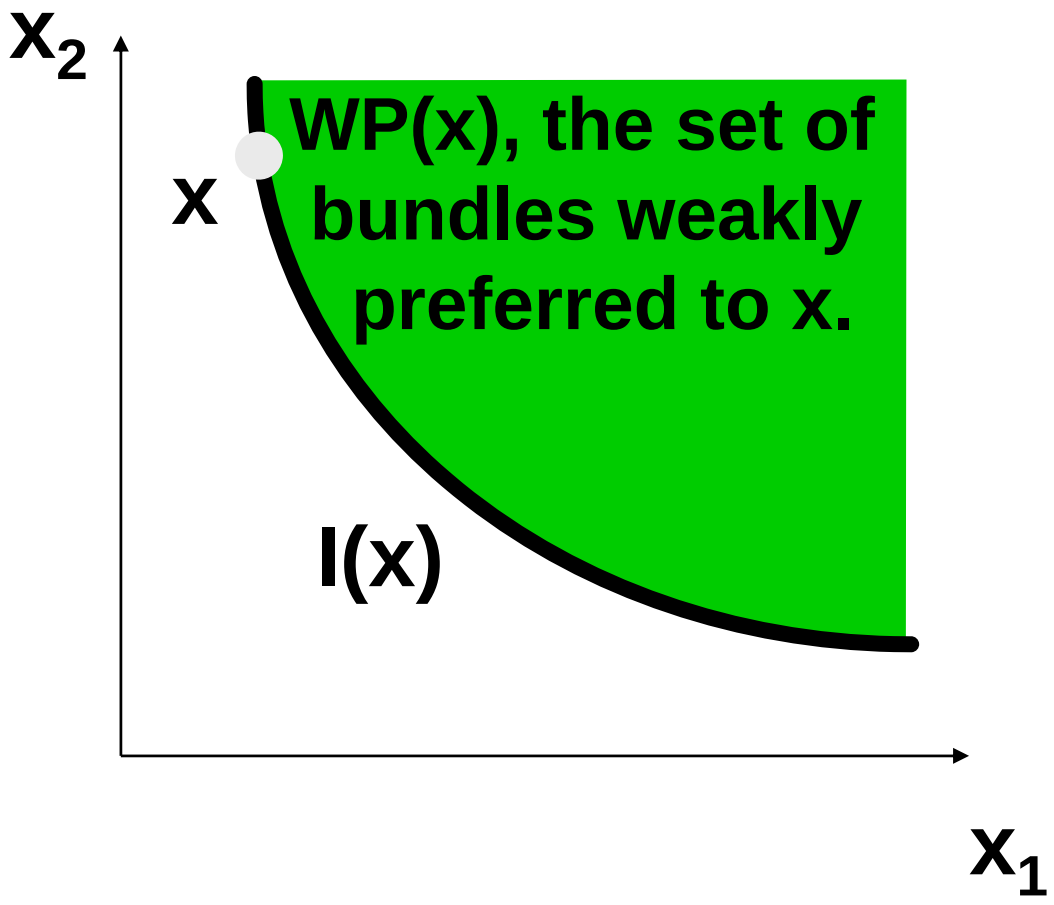
Indifference Curves



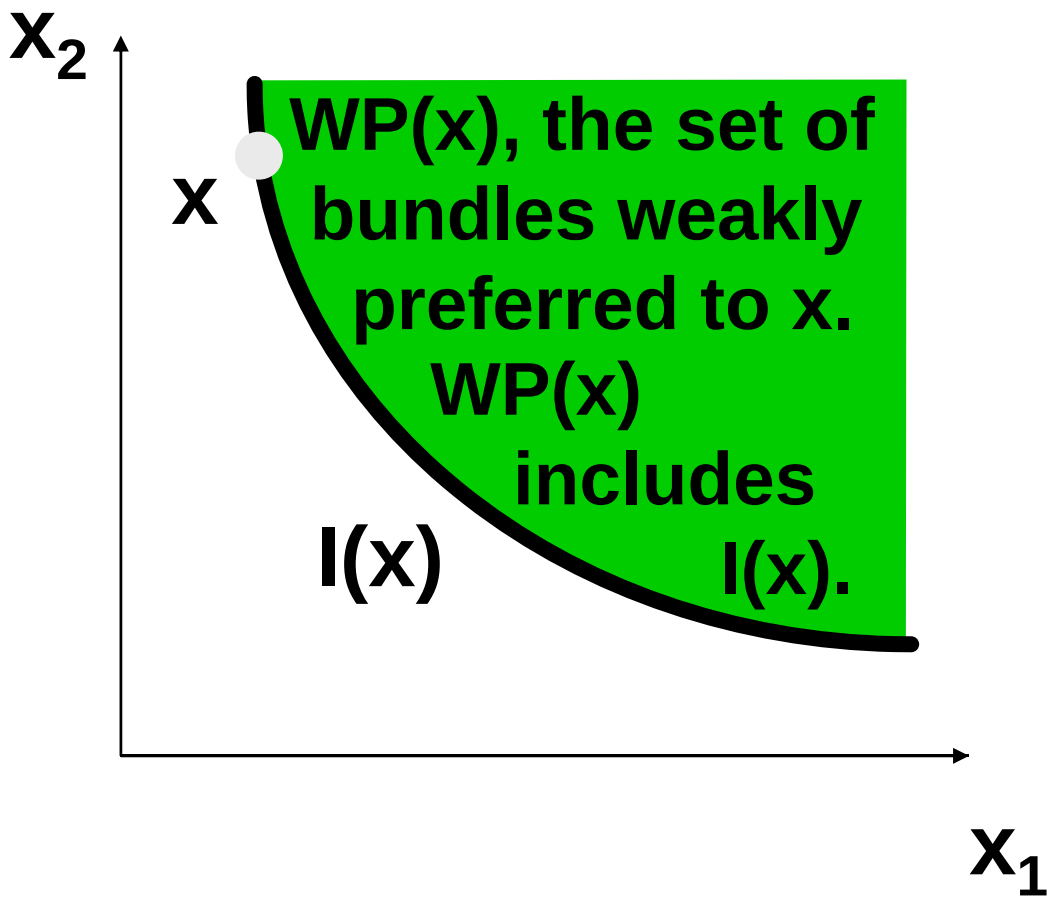
All bundles in I_1 are strictly preferred to all in I_2.

All bundles in I_2 are strictly preferred to all in I_3.

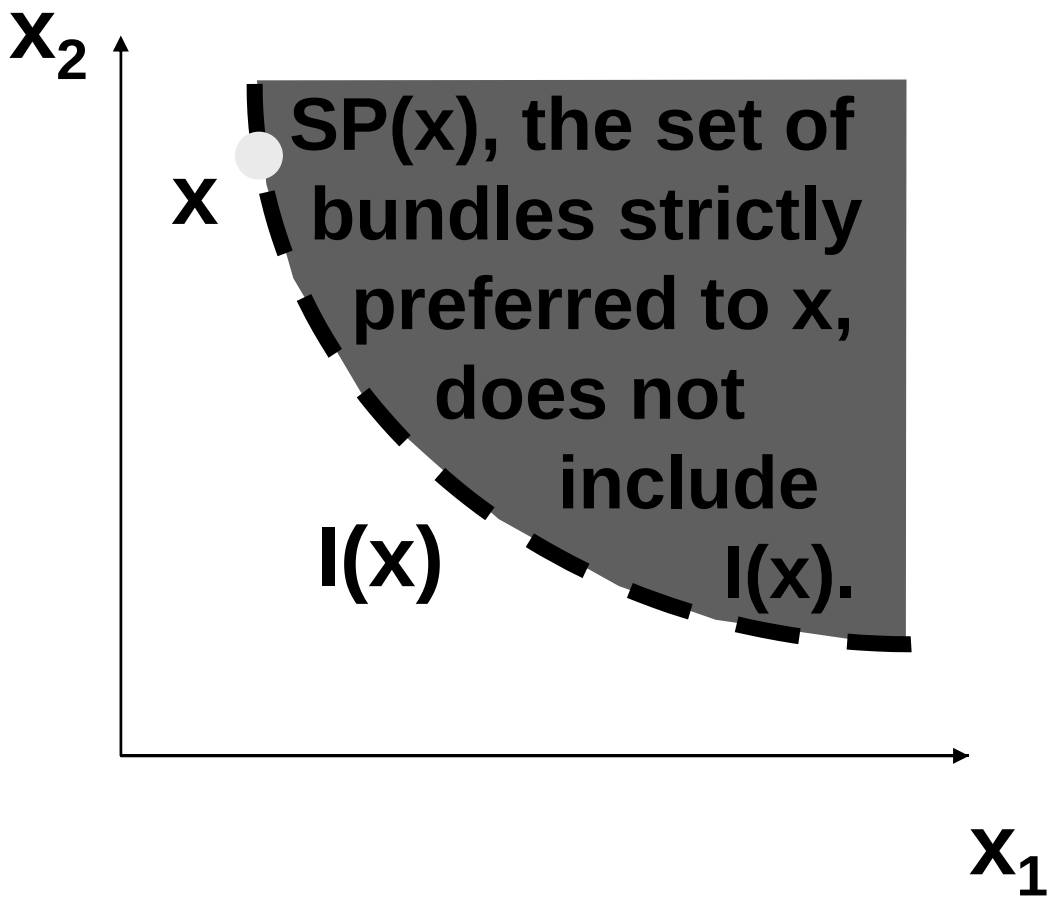
Indifference Curves



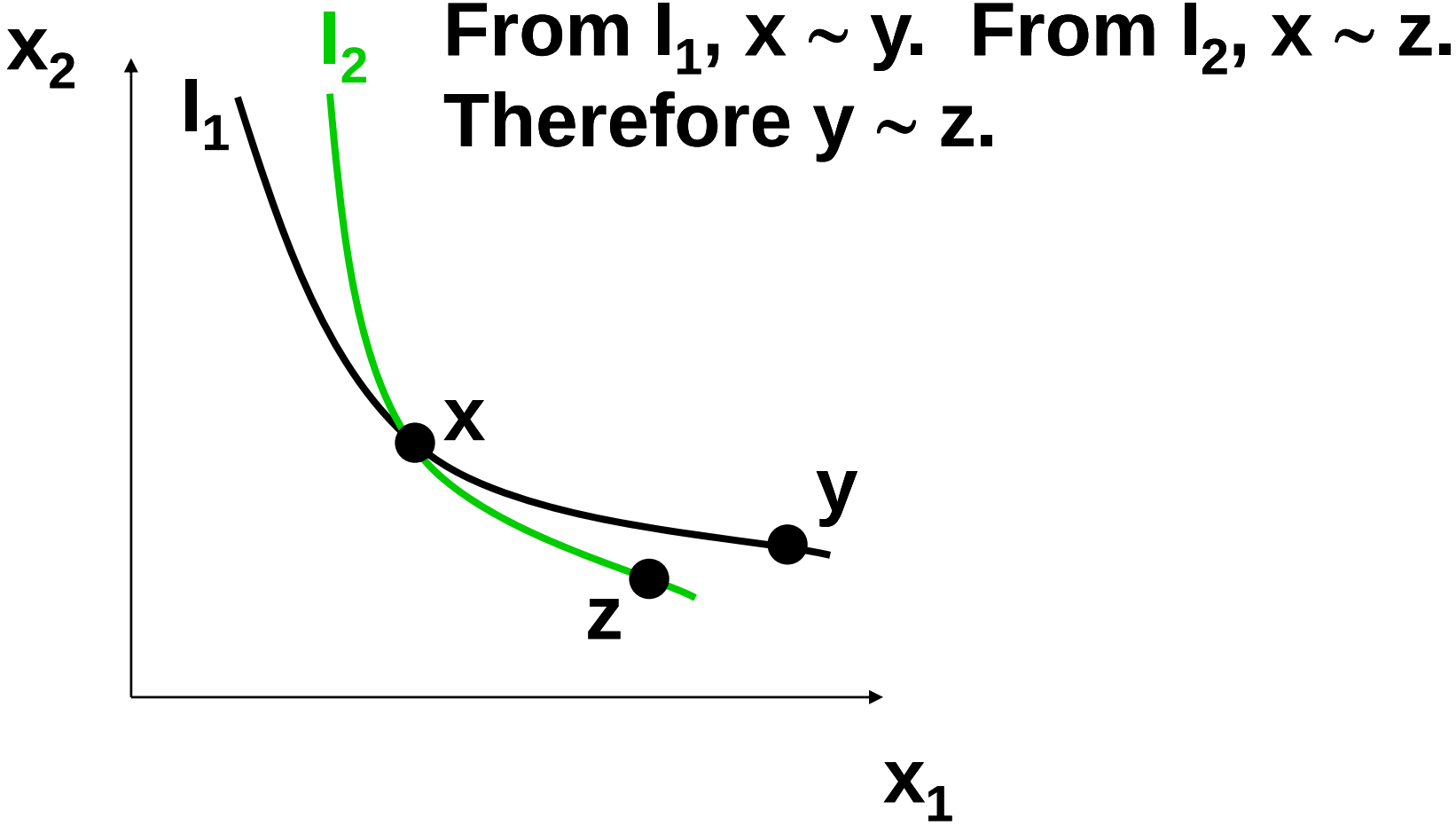
Indifference Curves



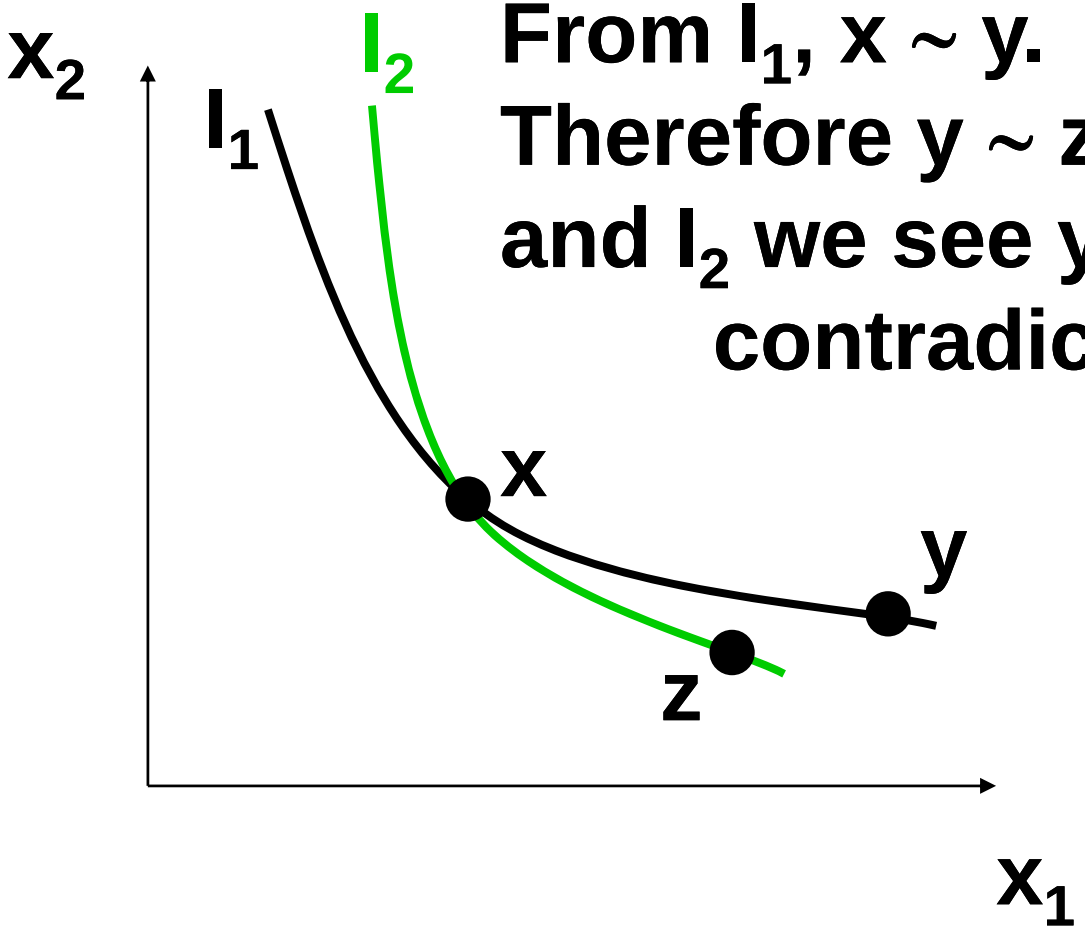
Indifference Curves



Indifference Curves Cannot Intersect



Indifference Curves Cannot Intersect

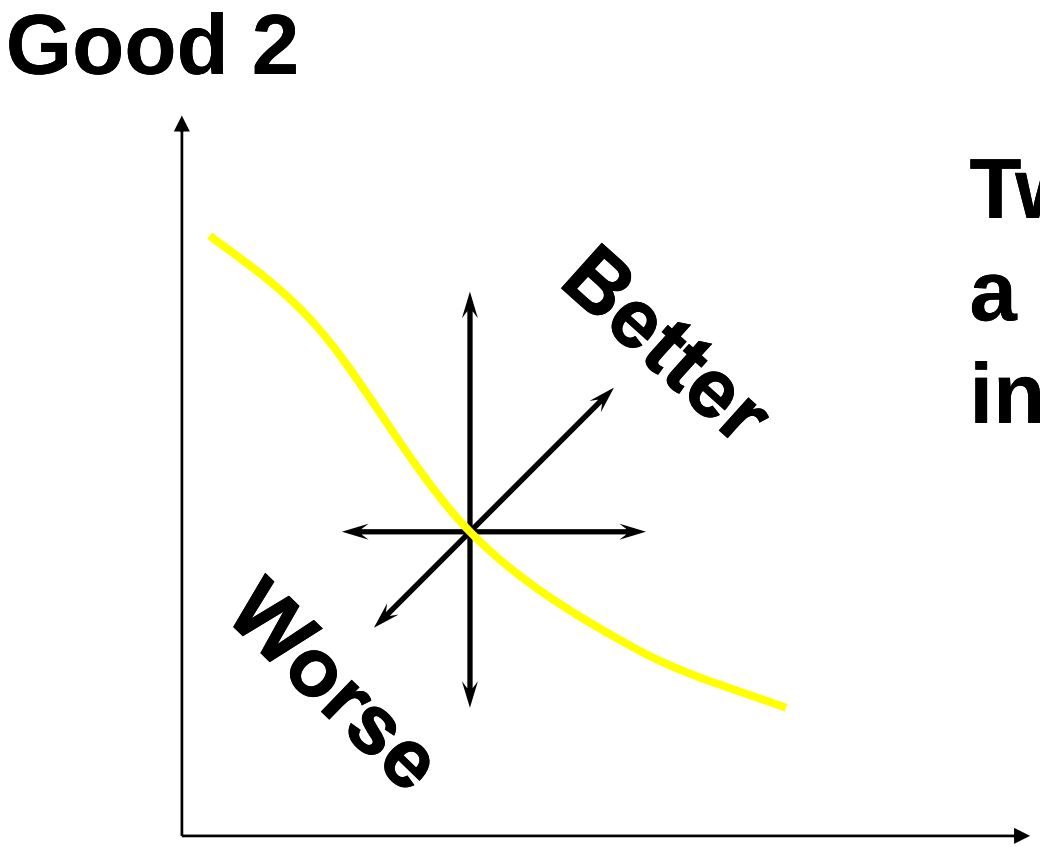


From I_1, $x \sim y$. From I_2, $x \sim z$. Therefore $y \sim z$. But from I_1 and I_2 we see $y \succ z$, a contradiction.

Slopes of Indifference Curves

- **When more of a commodity is always preferred, the commodity is a good.**
- **If every commodity is a good then indifference curves are negatively sloped.**

Slopes of Indifference Curves

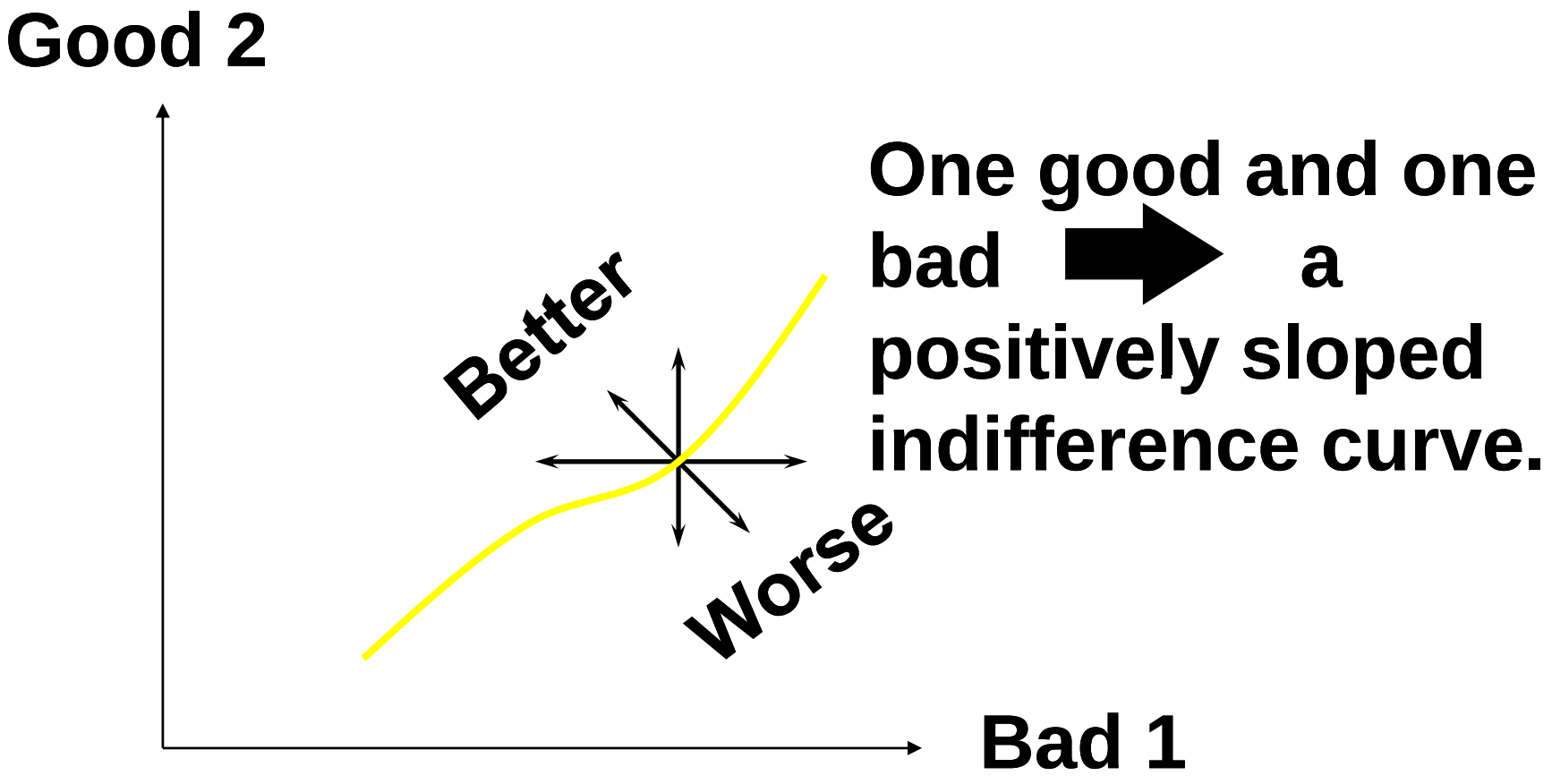


Two goods ➡ a negatively sloped indifference curve.

Slopes of Indifference Curves

- **If less of a commodity is always preferred then the commodity is a bad.**

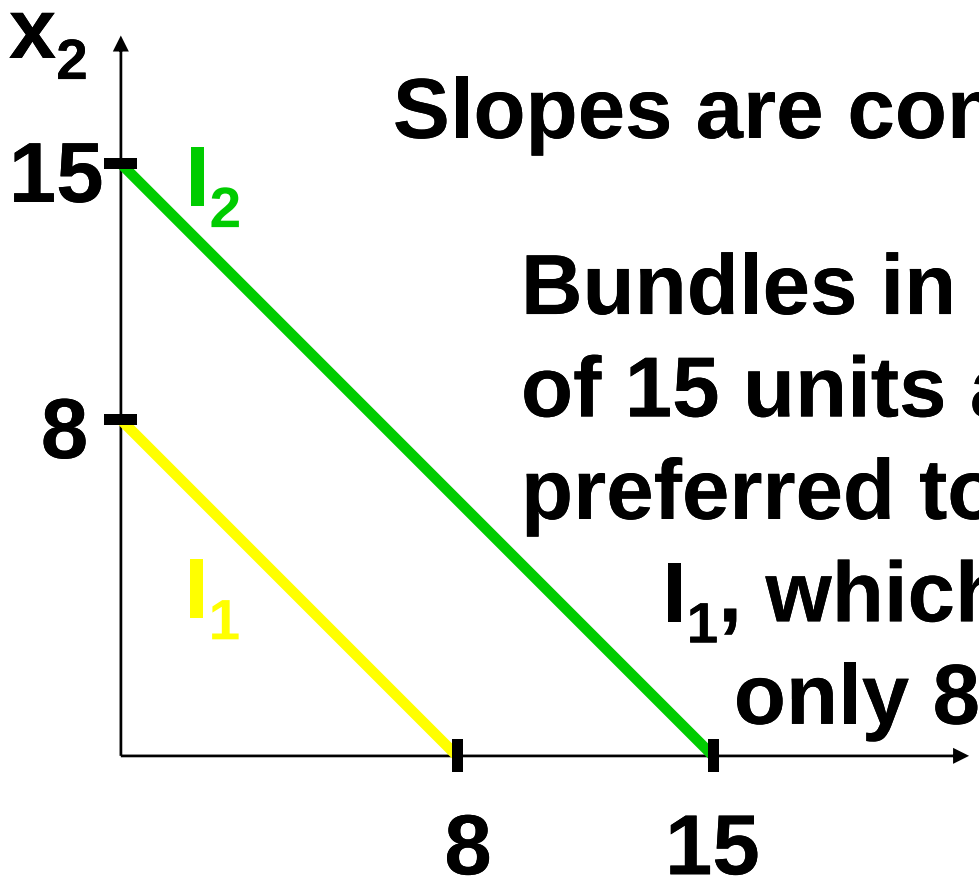
Slopes of Indifference Curves



Extreme Cases of Indifference Curves; Perfect Substitutes

- **If a consumer always regards units of commodities 1 and 2 as equivalent, then the commodities are perfect substitutes and only the total amount of the two commodities in bundles determines their preference rank-order.**

Extreme Cases of Indifference Curves; Perfect Substitutes



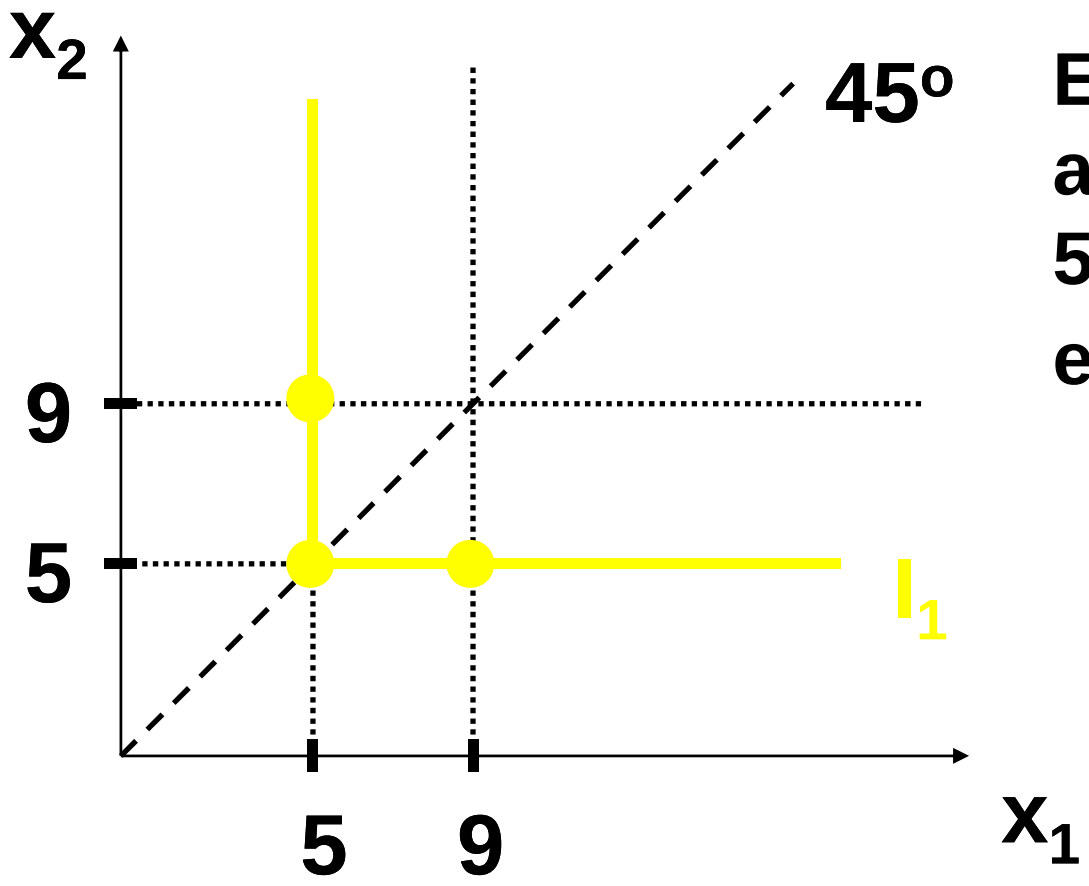
Slopes are constant at - 1.

Bundles in I_2 all have a total of 15 units and are strictly preferred to all bundles in I_1, which have a total of only 8 units in them.

Extreme Cases of Indifference Curves; Perfect Complements

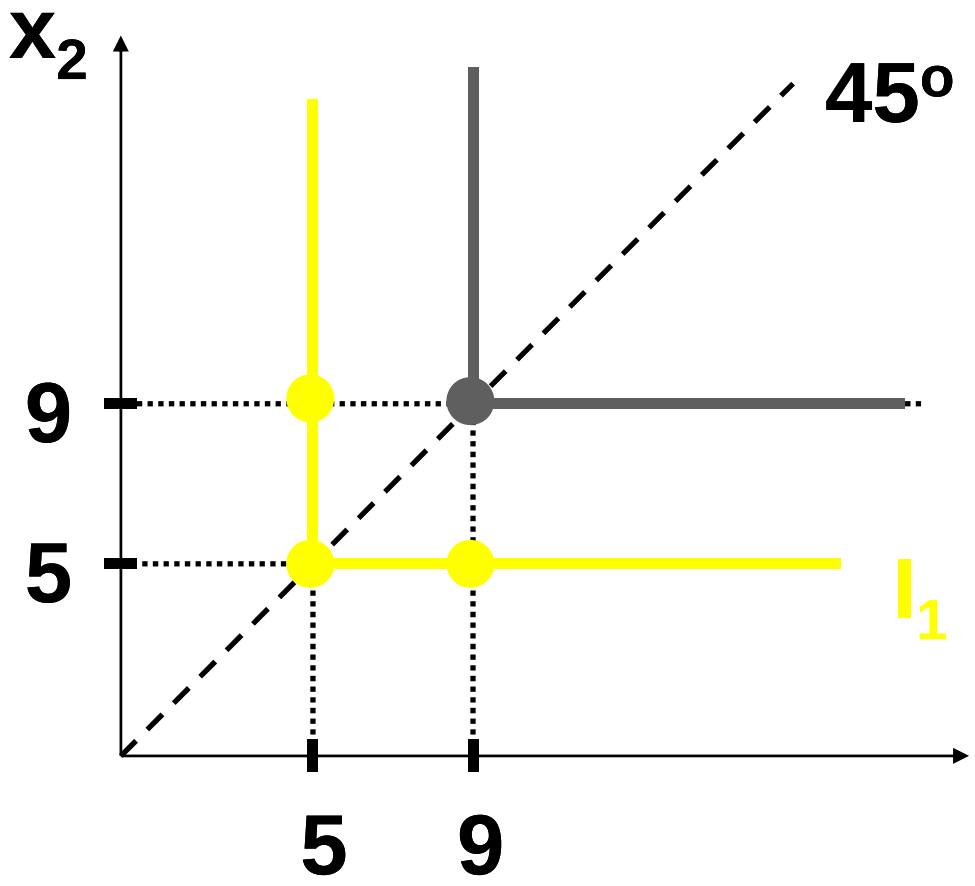
- **If a consumer always consumes commodities 1 and 2 in fixed proportion (e.g. one-to-one), then the commodities are perfect complements and only the number of pairs of units of the two commodities determines the preference rank-order of bundles.**

Extreme Cases of Indifference Curves; Perfect Complements



Each of (5,5), (5,9) and (9,5) contains 5 pairs so each is equally preferred.

Extreme Cases of Indifference Curves; Perfect Complements

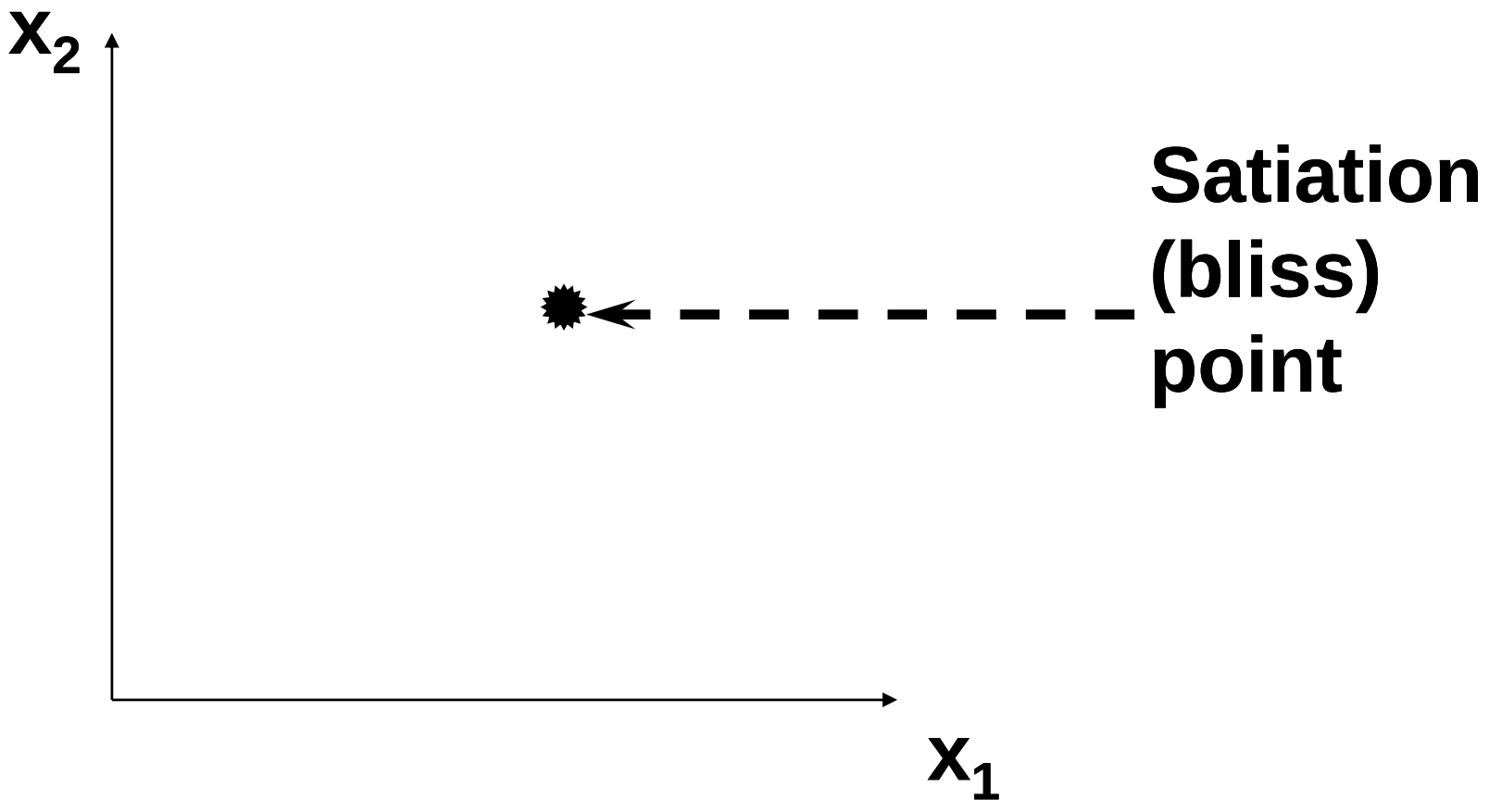


Since each of (5,5), (5,9) and (9,5) contains 5 pairs, each is less preferred than the bundle (9,9) which contains 9 pairs.

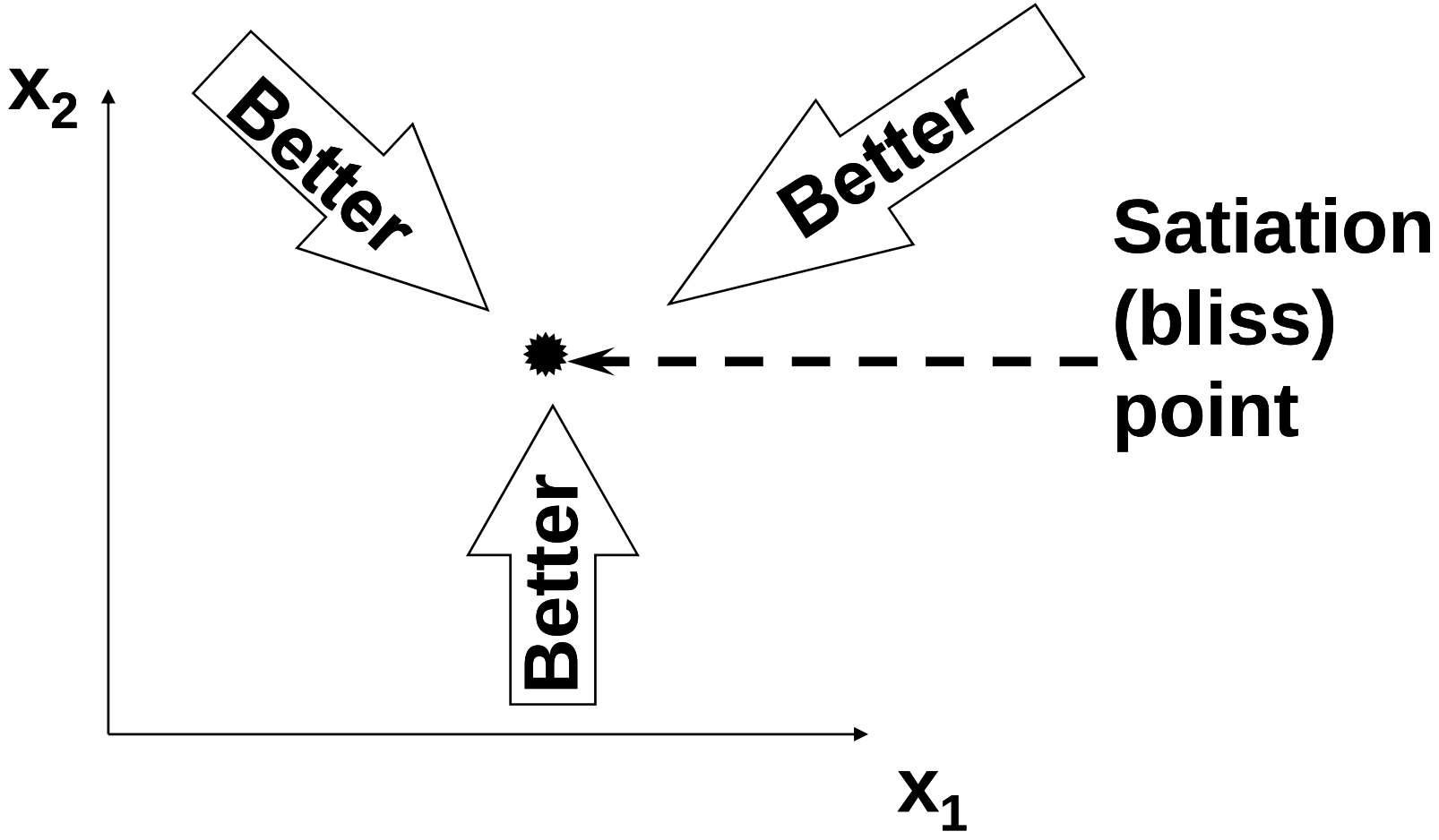
Preferences Exhibiting Satiation

- **A bundle strictly preferred to any other is a satiation point or a bliss point.**
- **What do indifference curves look like for preferences exhibiting satiation?**

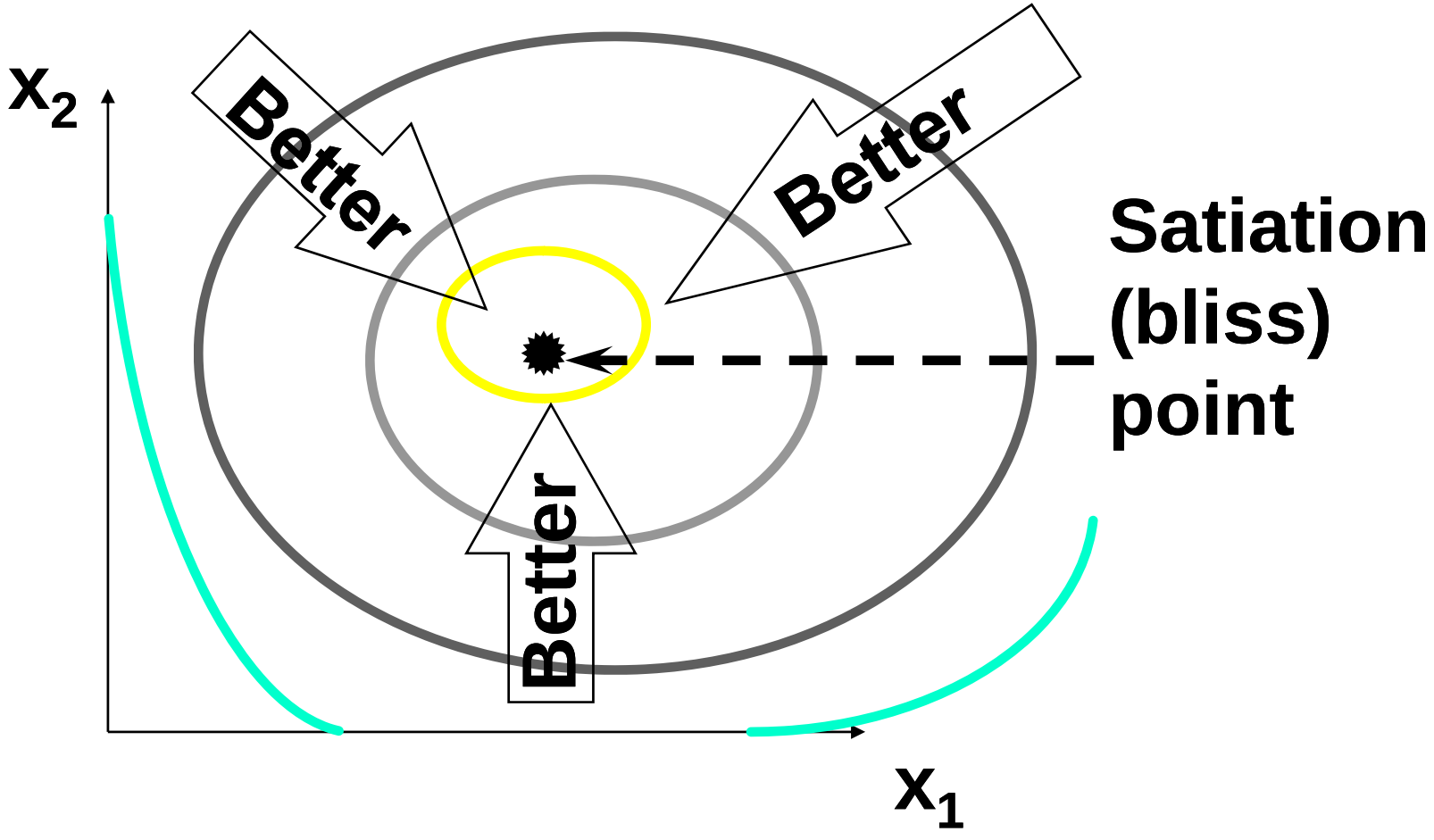
Indifference Curves Exhibiting Satiation



Indifference Curves Exhibiting Satiation



Indifference Curves Exhibiting Satiation



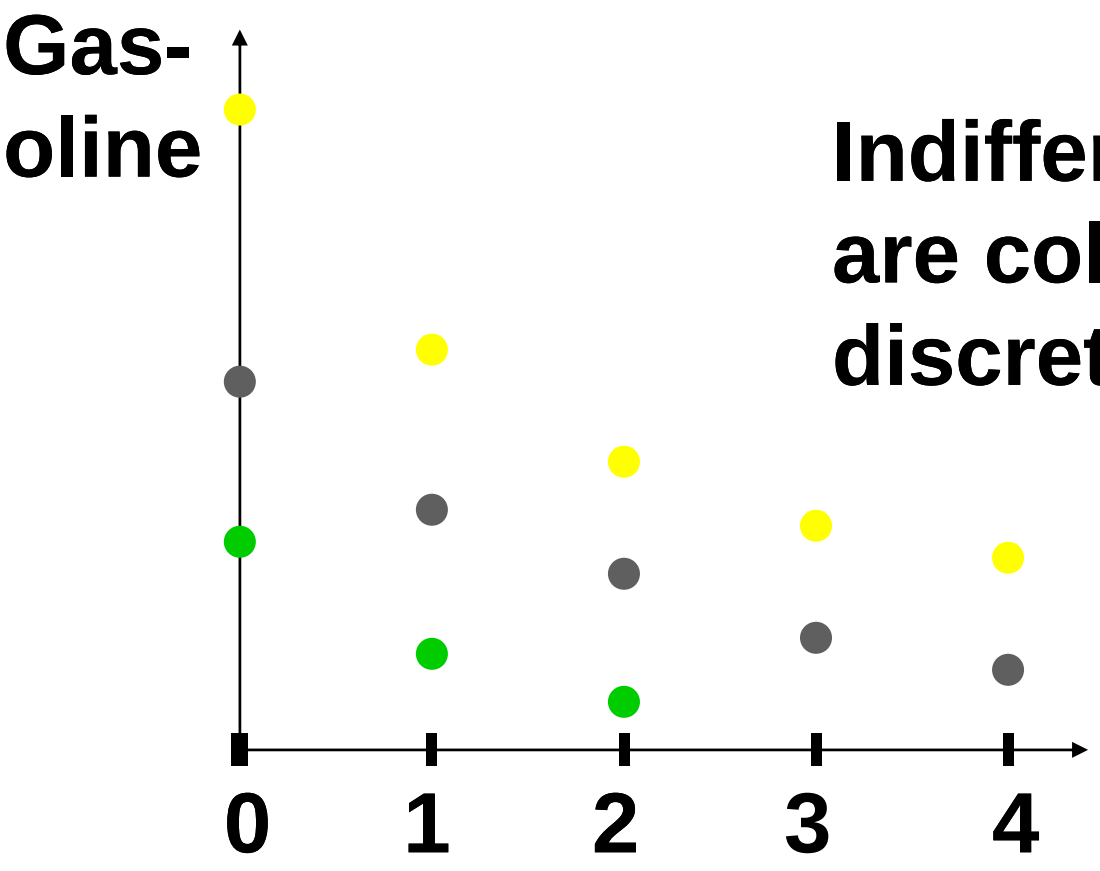
Indifference Curves for Discrete Commodities

- **A commodity is infinitely divisible if it can be acquired in any quantity; *e.g.* water or cheese.**
- **A commodity is discrete if it comes in unit lumps of 1, 2, 3, … and so on; *e.g.* aircraft, ships and refrigerators.**

Indifference Curves for Discrete Commodities

- **Suppose commodity 2 is an infinitely divisible good (gasoline) while commodity 1 is a discrete good (aircraft). What do indifference "curves" look like?**

Indifference Curves With a Discrete Good



Indifference "curves" are collections of discrete points.

Well-Behaved Preferences

- **A preference relation is "well-behaved" if it is**
  - **monotonic and convex.**
- **Monotonicity: More of any commodity is always preferred (*i.e.* no satiation and every commodity is a good).**

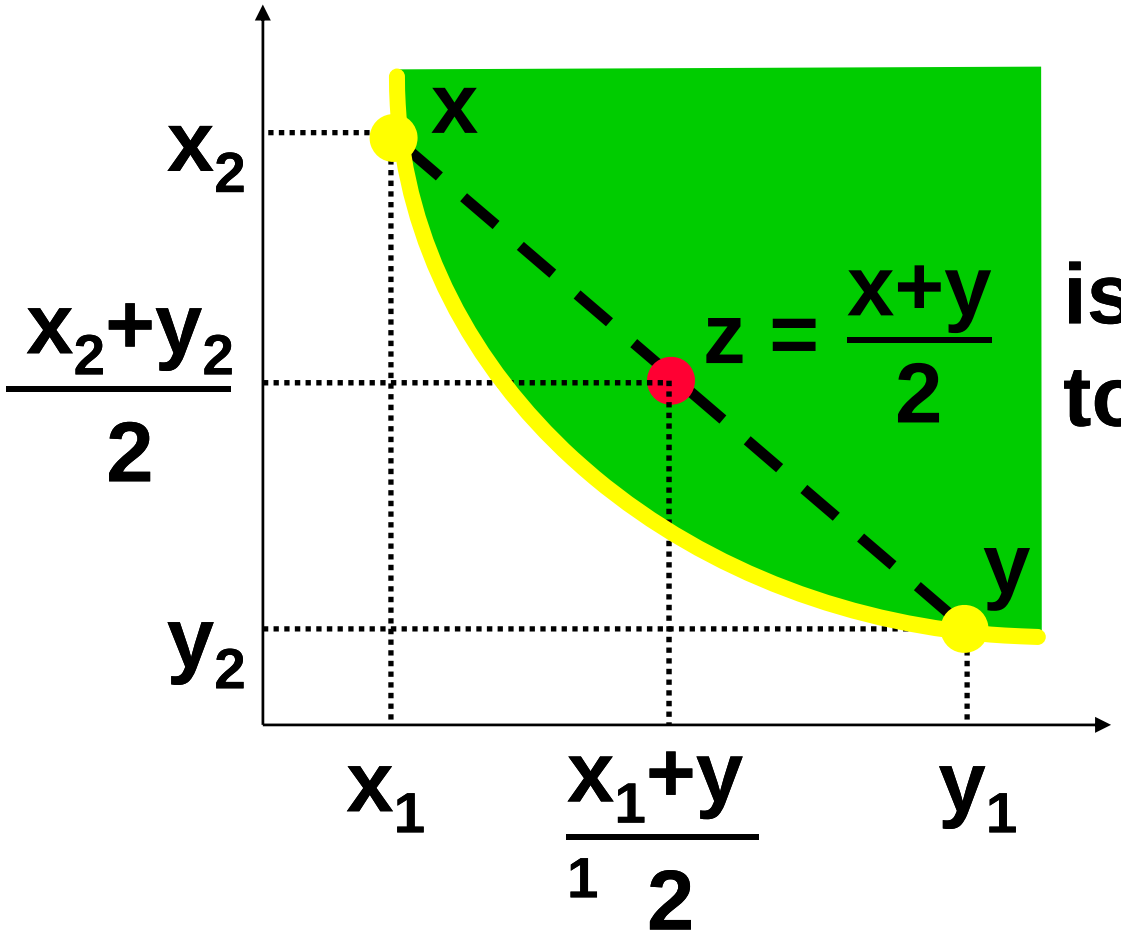
Well-Behaved Preferences

- **Convexity: Mixtures of bundles are (at least weakly) preferred to the bundles themselves. E.g., the 50-50 mixture of the bundles x and y is**

  z = (0.5)x + (0.5)y.

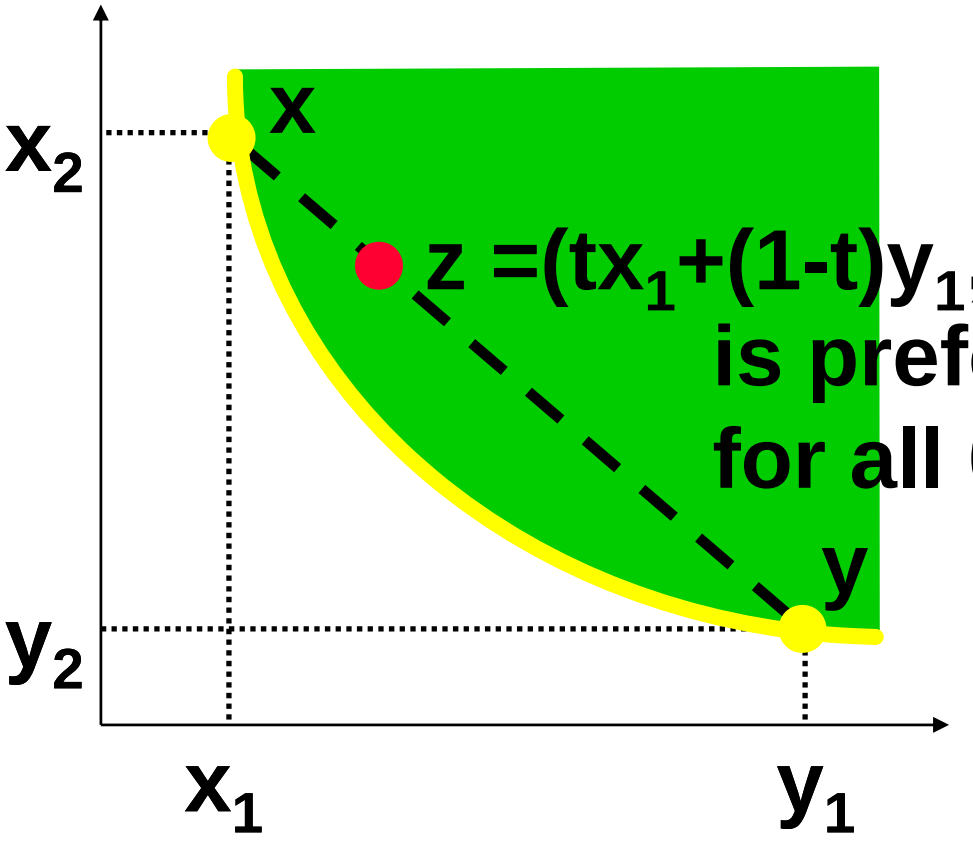
  z is at least as preferred as x or y.

Well-Behaved Preferences -- Convexity.



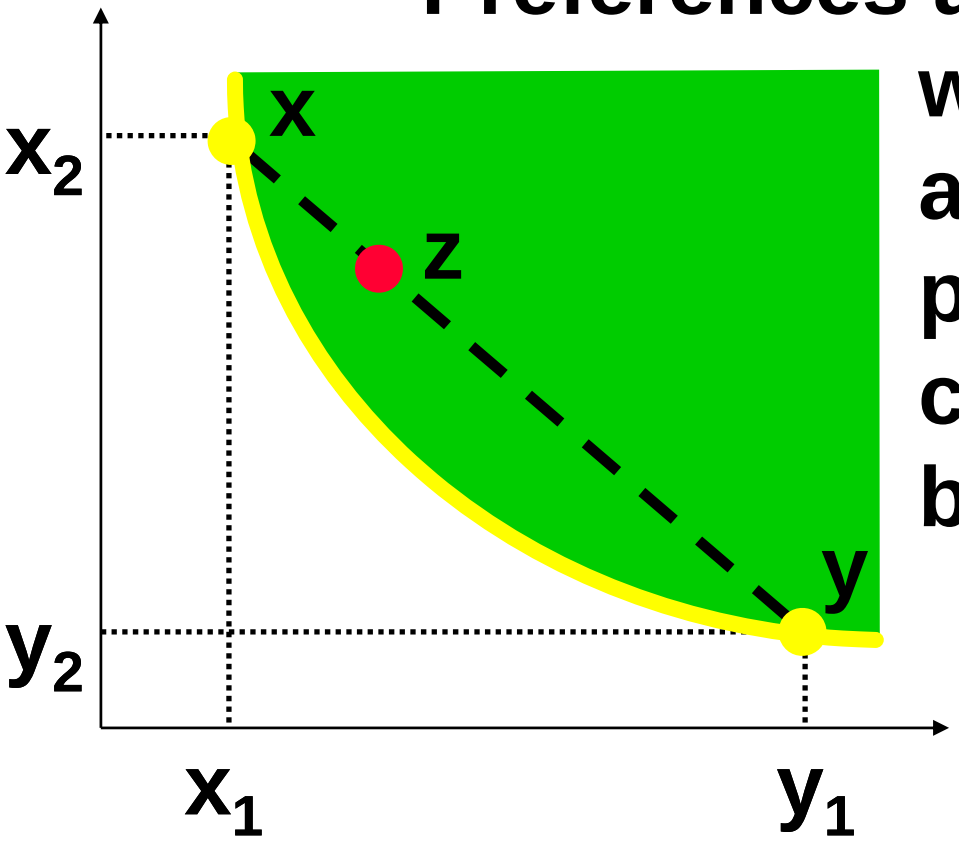
is strictly preferred to both x and y.

Well-Behaved Preferences -- Convexity.



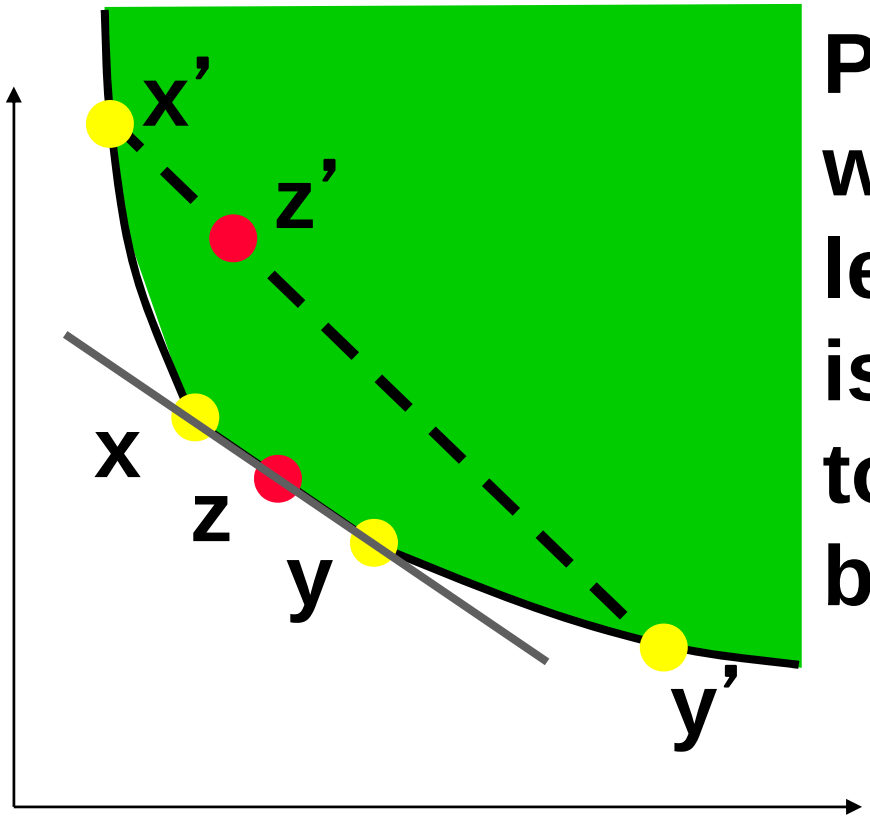
$z = (tx_1 + (1-t)y_1,\ tx_2 + (1-t)y_2)$ is preferred to x and y for all $0 < t < 1$.

Well-Behaved Preferences -- Convexity.



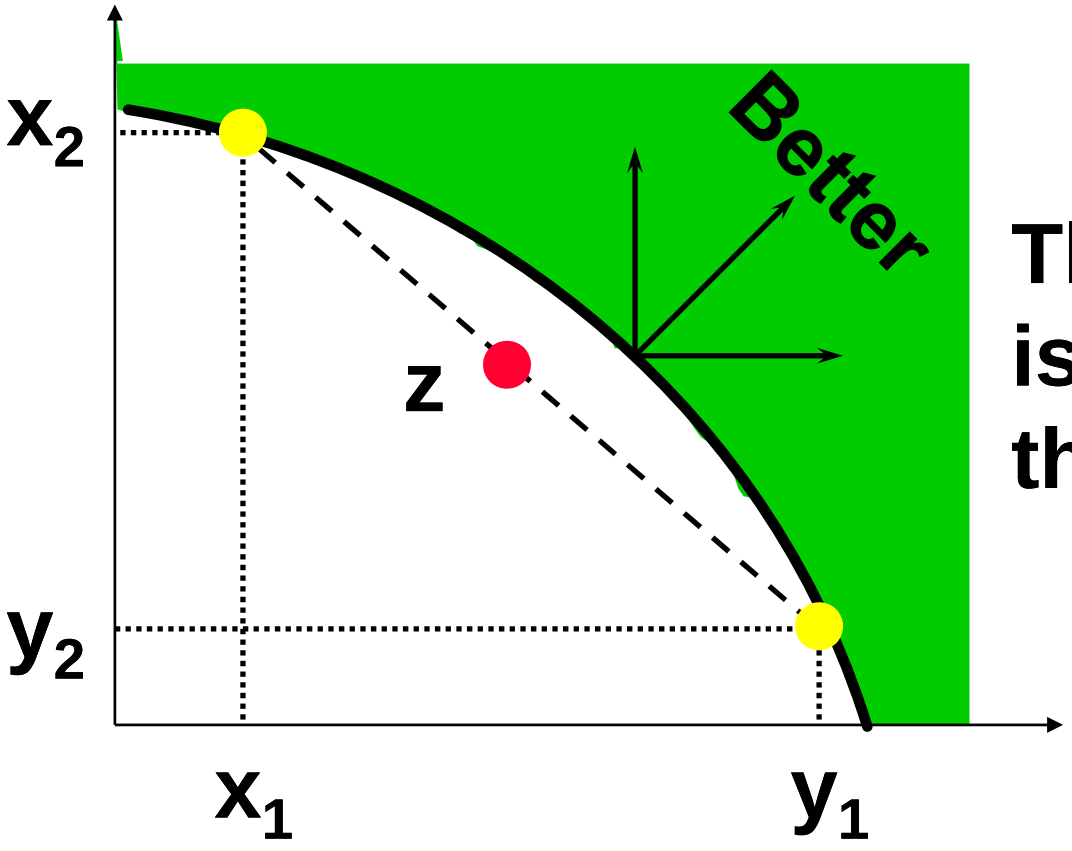
Preferences are strictly convex when all mixtures z are strictly preferred to their component bundles x and y.

Well-Behaved Preferences -- Weak Convexity.



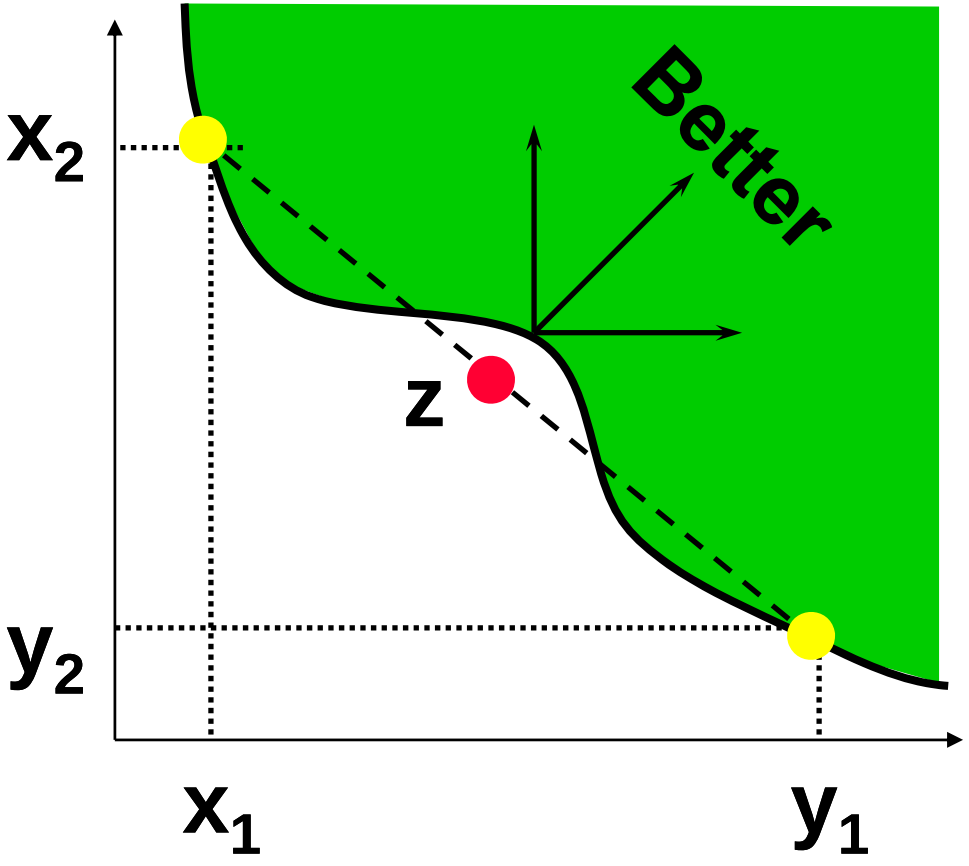
Preferences are weakly convex if at least one mixture z is equally preferred to a component bundle.

Non-Convex Preferences



The mixture z is less preferred than x or y.

More Non-Convex Preferences

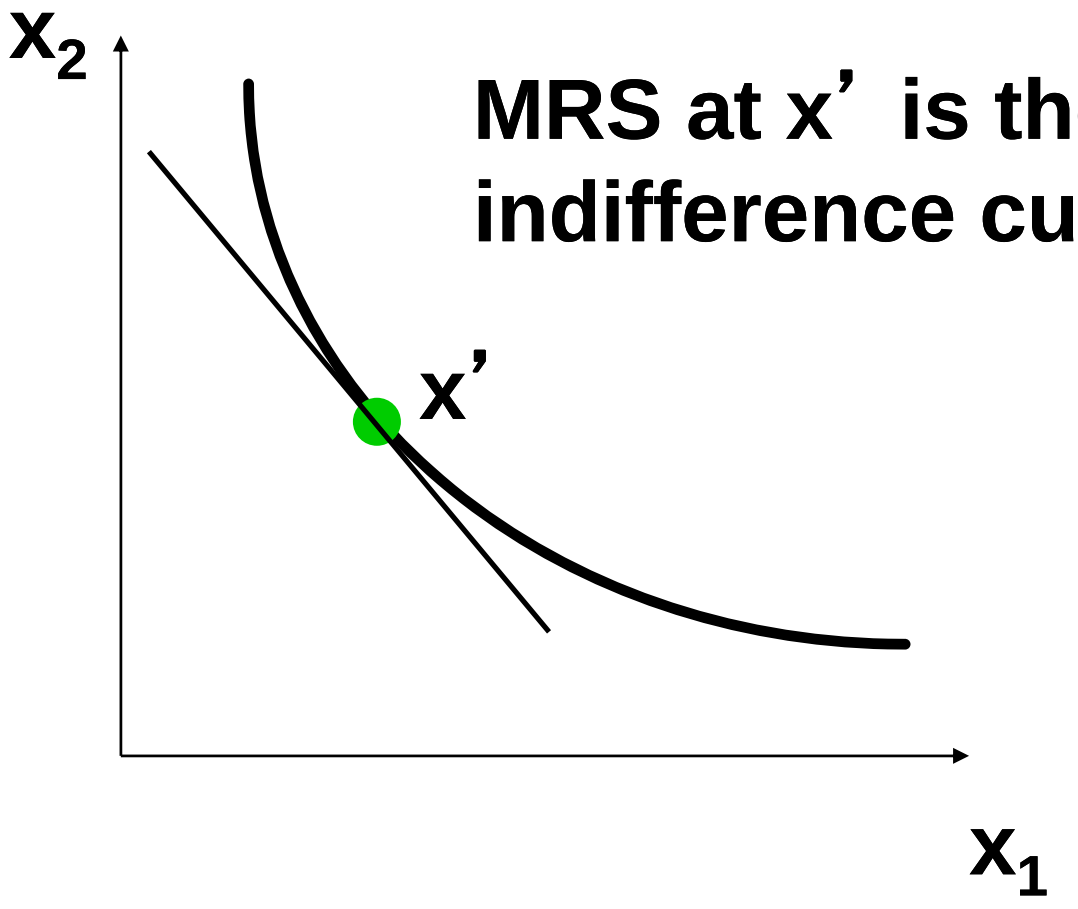


The mixture z is less preferred than x or y.

Slopes of Indifference Curves

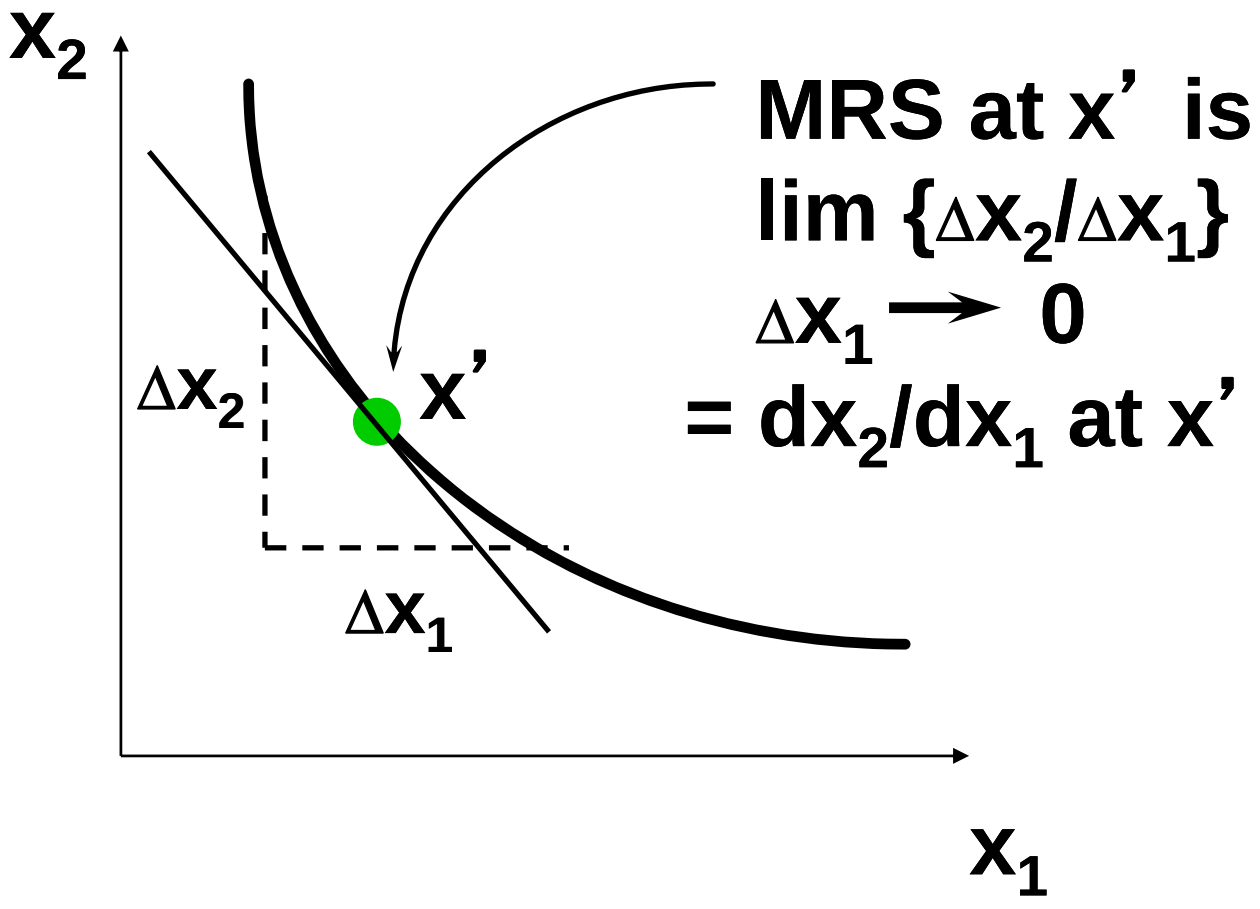
- **The slope of an indifference curve is its marginal rate-of-substitution (MRS).**
- **How can a MRS be calculated?**

Marginal Rate of Substitution



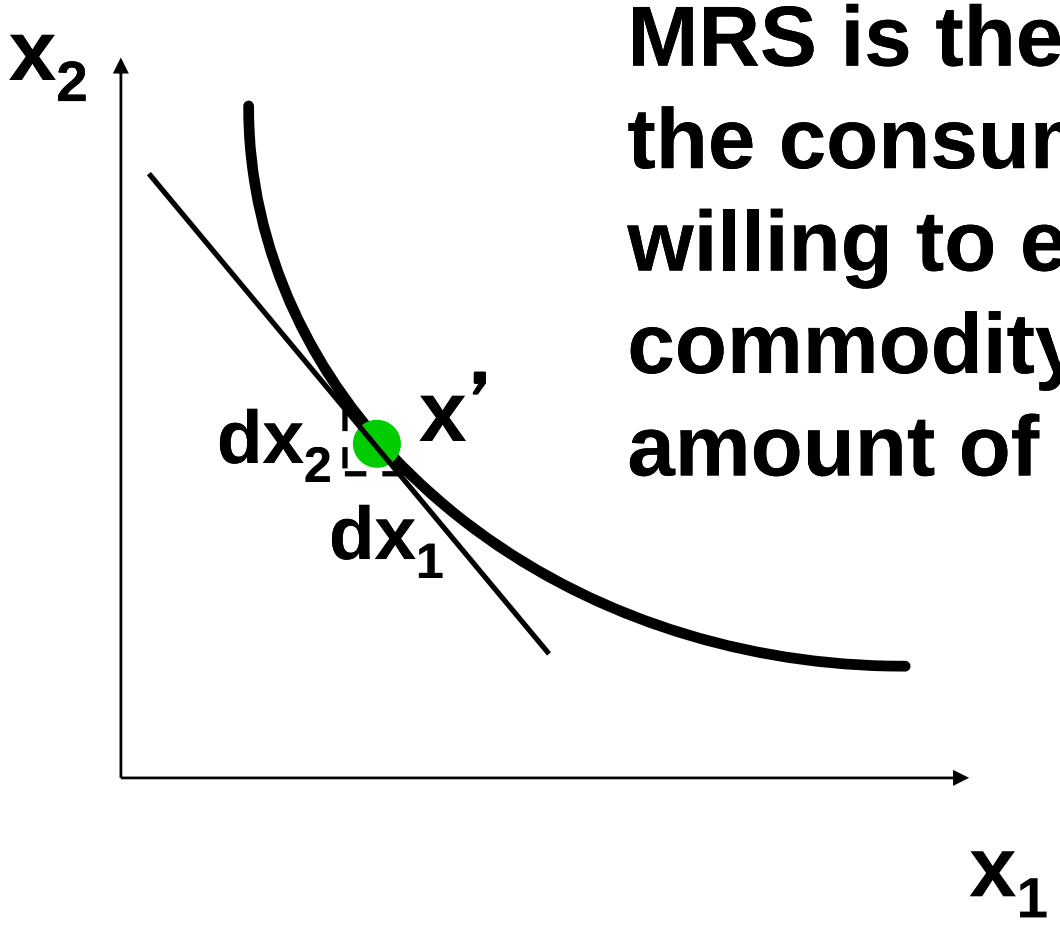
MRS at x' is the slope of the indifference curve at x'

Marginal Rate of Substitution

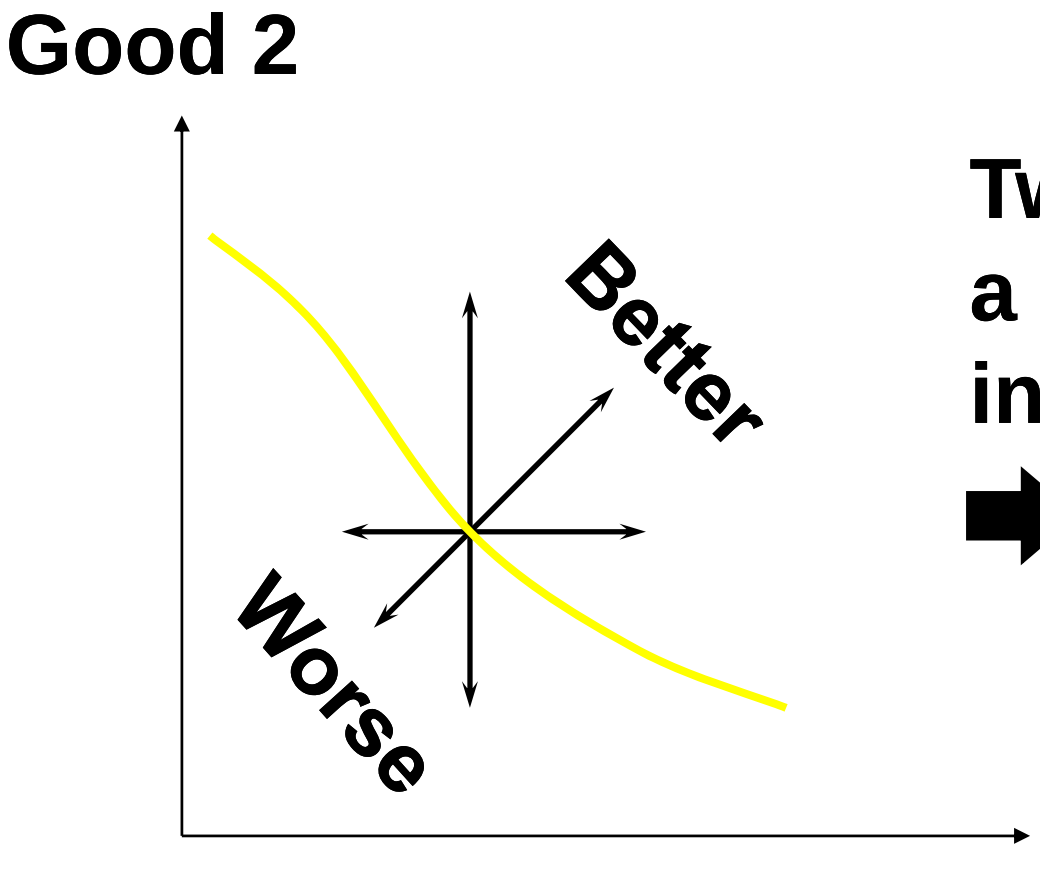


Marginal Rate of Substitution

$dx_2 = MRS \times dx_1$ so, at x', MRS is the rate at which the consumer is only just willing to exchange commodity 2 for a small amount of commodity 1.



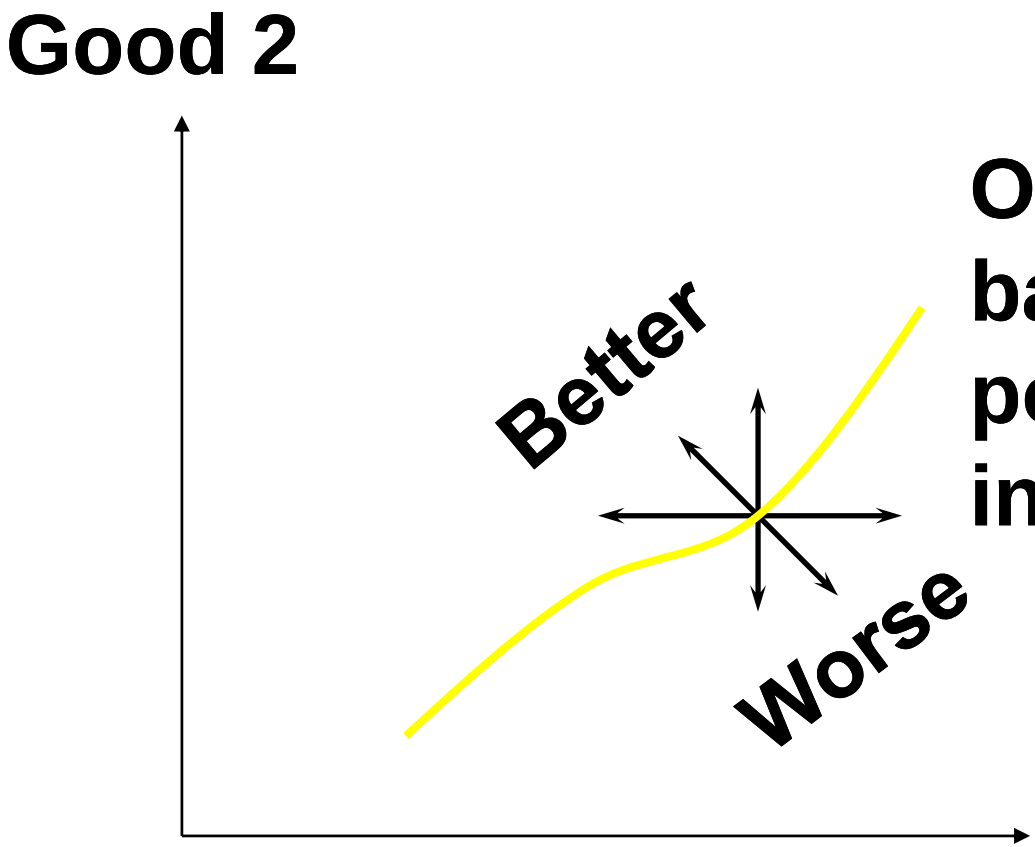
MRS & Ind. Curve Properties



Two goods ➡
a negatively sloped indifference curve

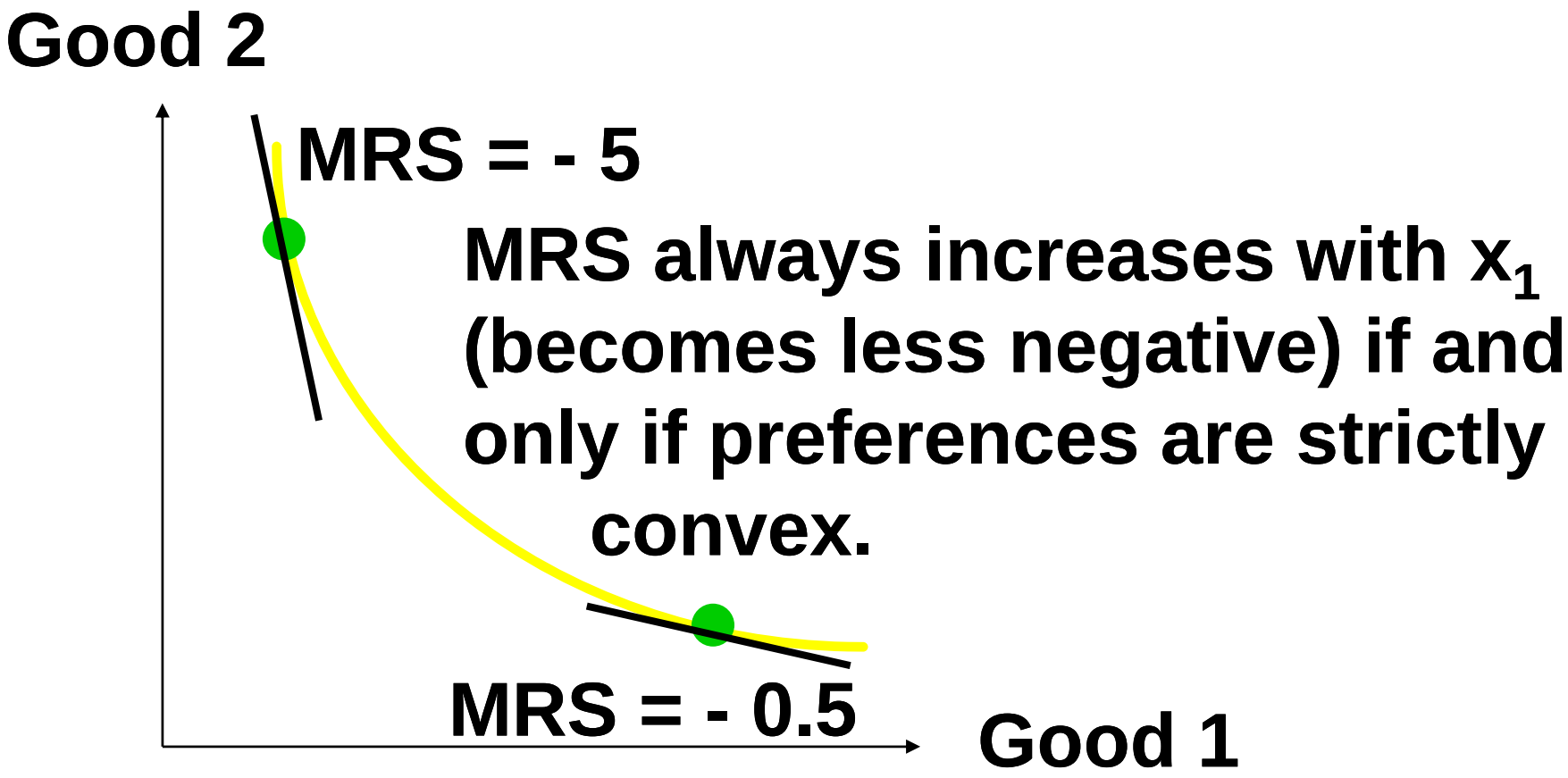
➡ MRS < 0.

MRS & Ind. Curve Properties

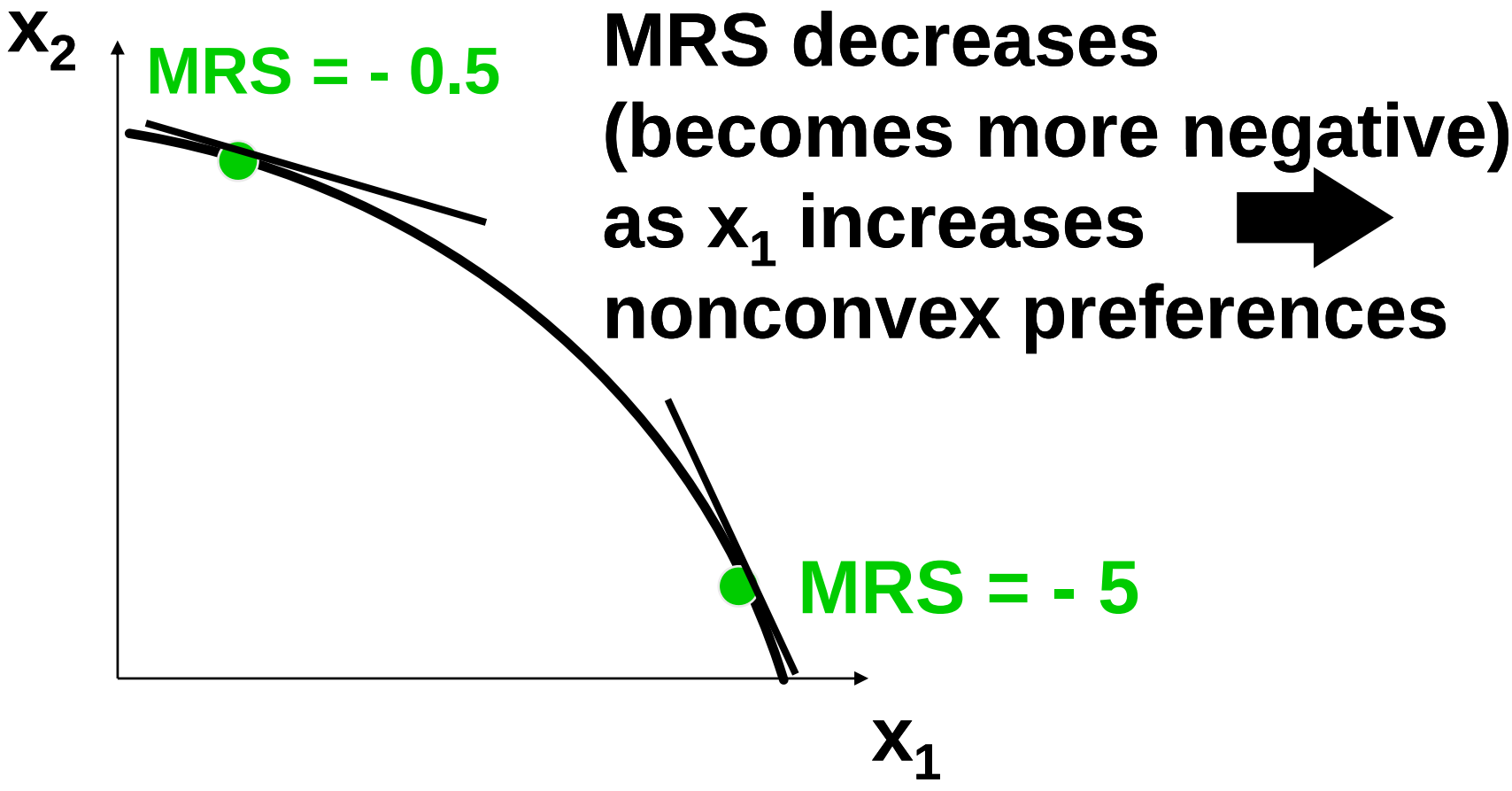


One good and one bad ➡ a positively sloped indifference curve ➡ MRS > 0.

MRS & Ind. Curve Properties



MRS & Ind. Curve Properties



MRS & Ind. Curve Properties