Chapter Three

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.

$\sim$ denotes indifference; $x \sim y$ 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.*

$$x \succsim x.$$

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.*

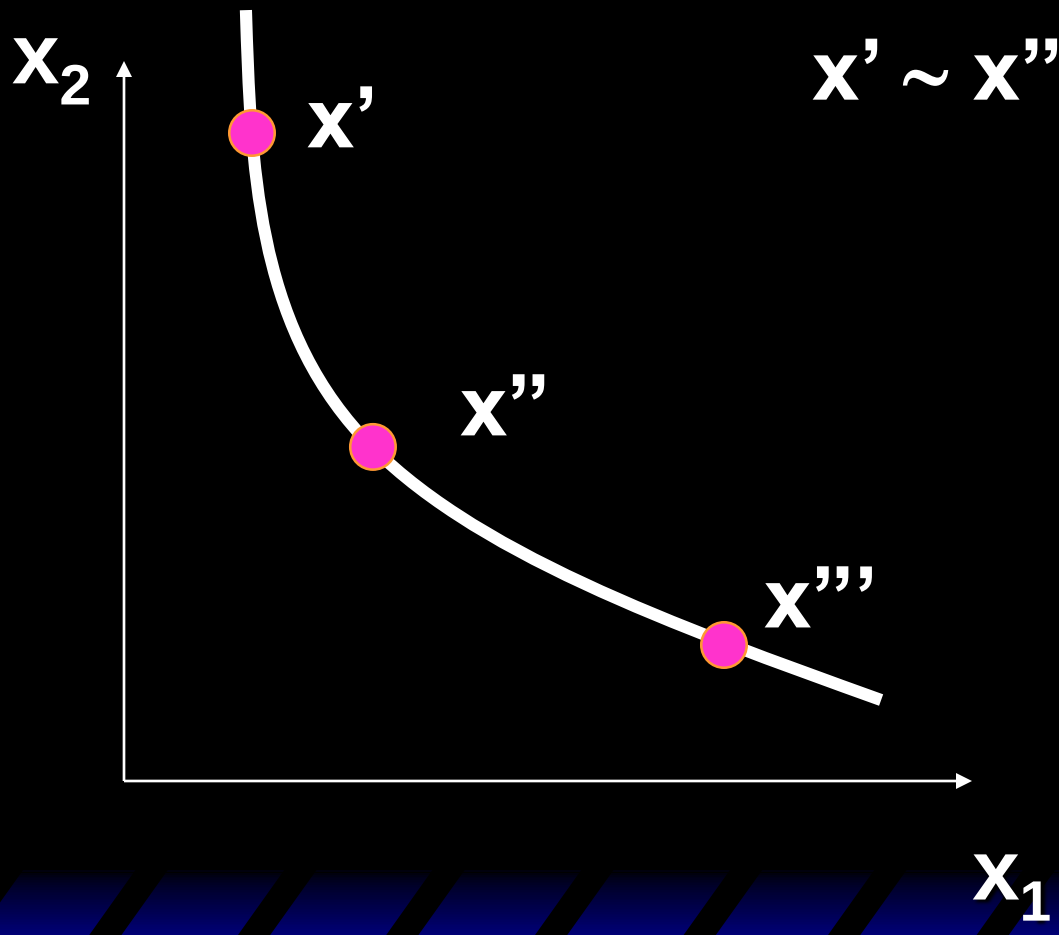
$x \succsim y$ **and** $y \succsim z \rightarrow x \succsim z$.

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'.

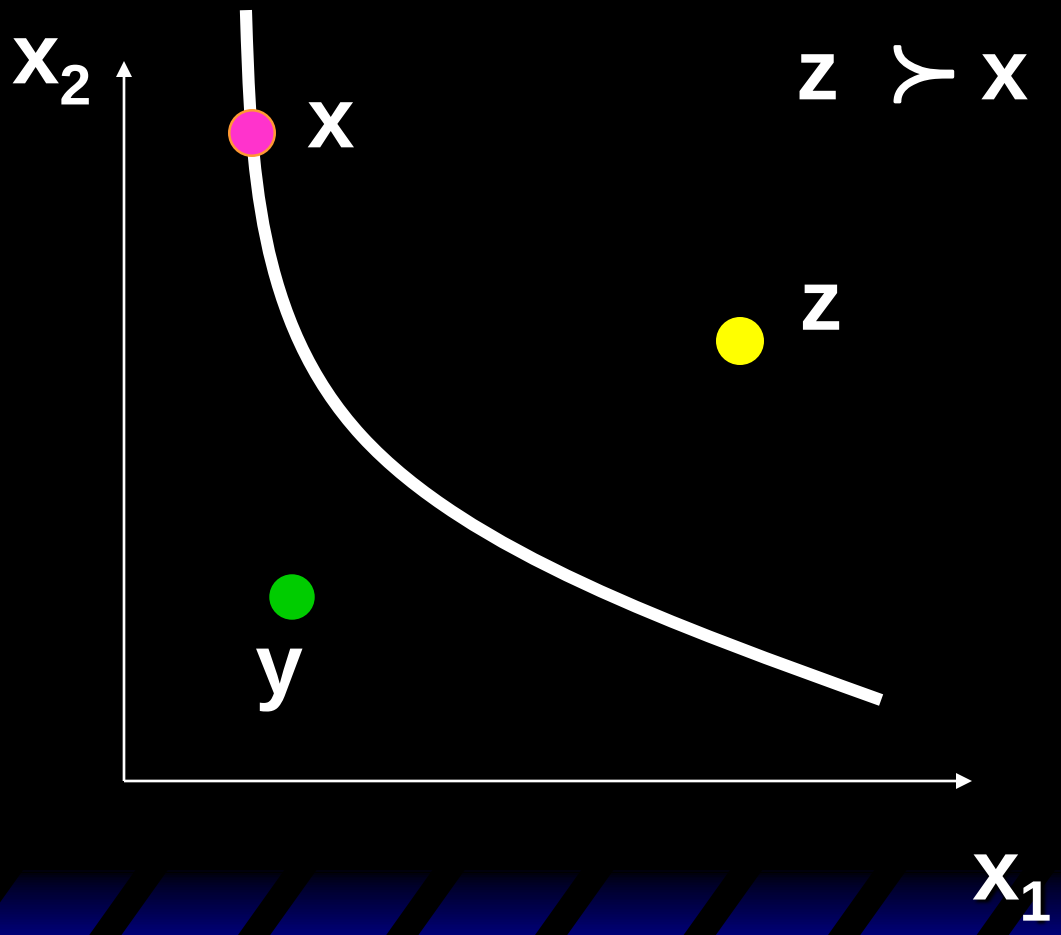
Since an indifference "curve" is not always a curve a better name might be an indifference "set".

Indifference Curves



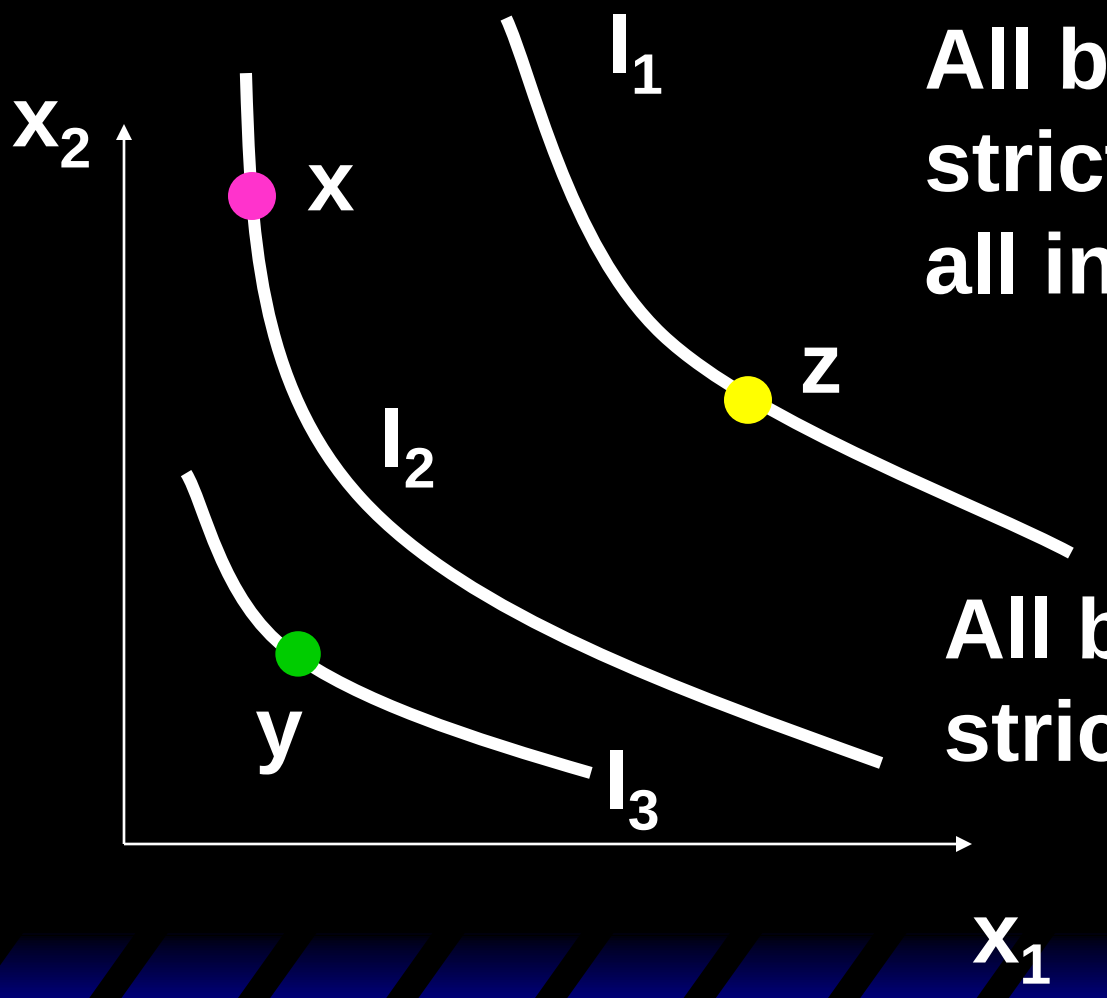
$x' \sim x'' \sim x'''$

Indifference Curves



$z \succ x \succ y$

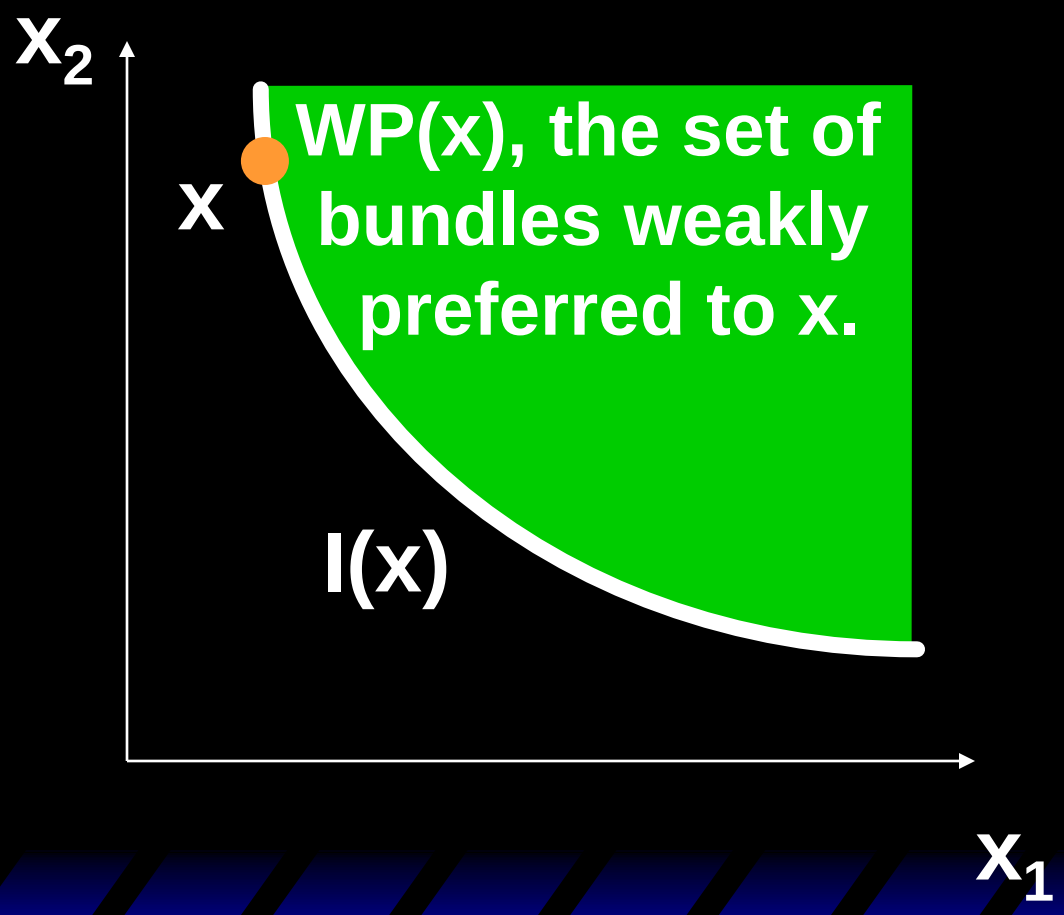
Indifference Curves



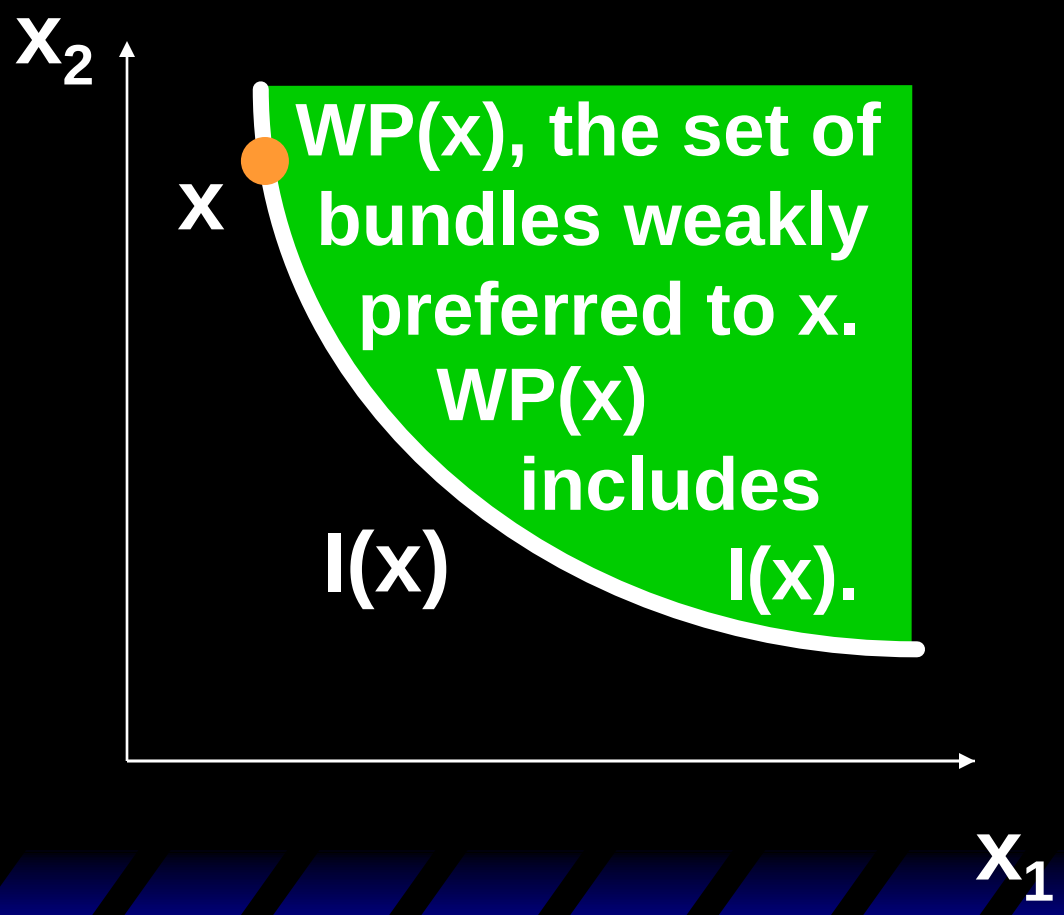
All bundles in I_1 are strictly preferred to all in I_2.

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

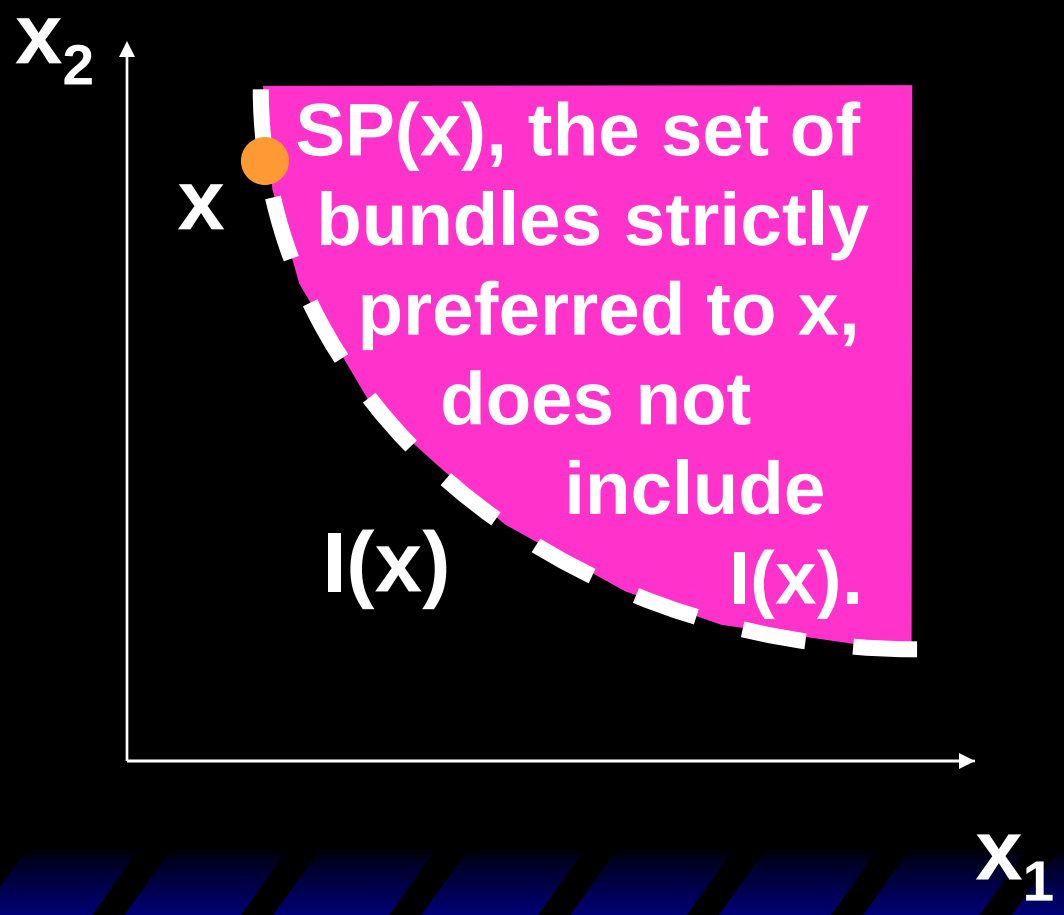
Indifference Curves



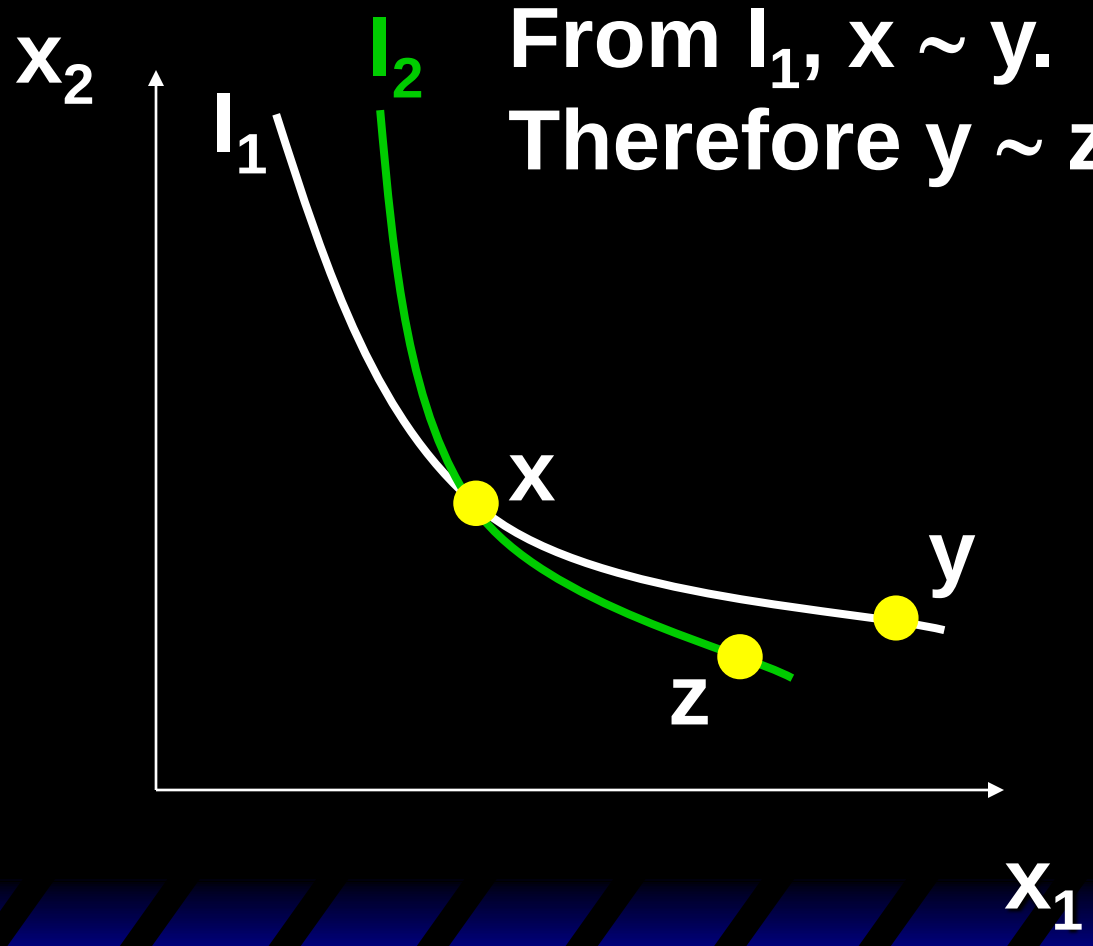
Indifference Curves



Indifference Curves

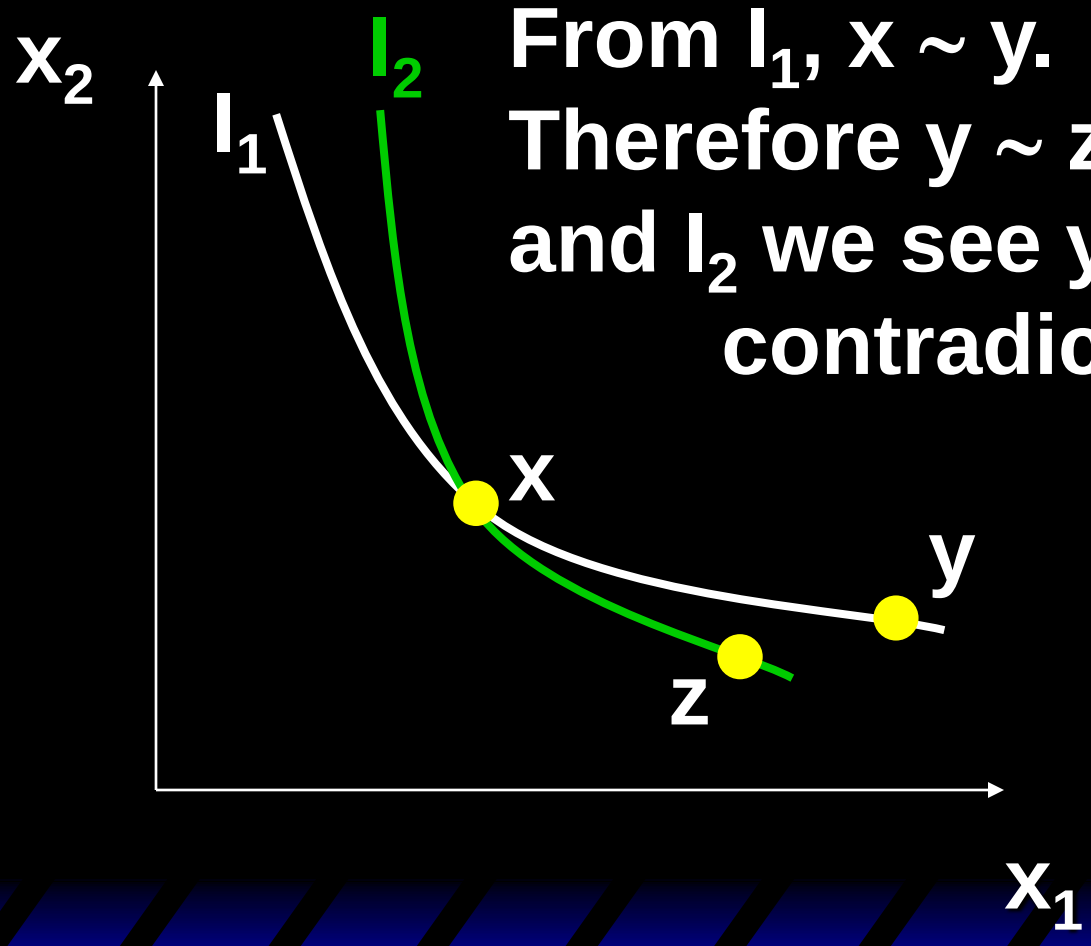


Indifference Curves Cannot Intersect



From I_1, x ~ y. From I_2, x ~ z. Therefore y ~ z.

Indifference Curves Cannot Intersect



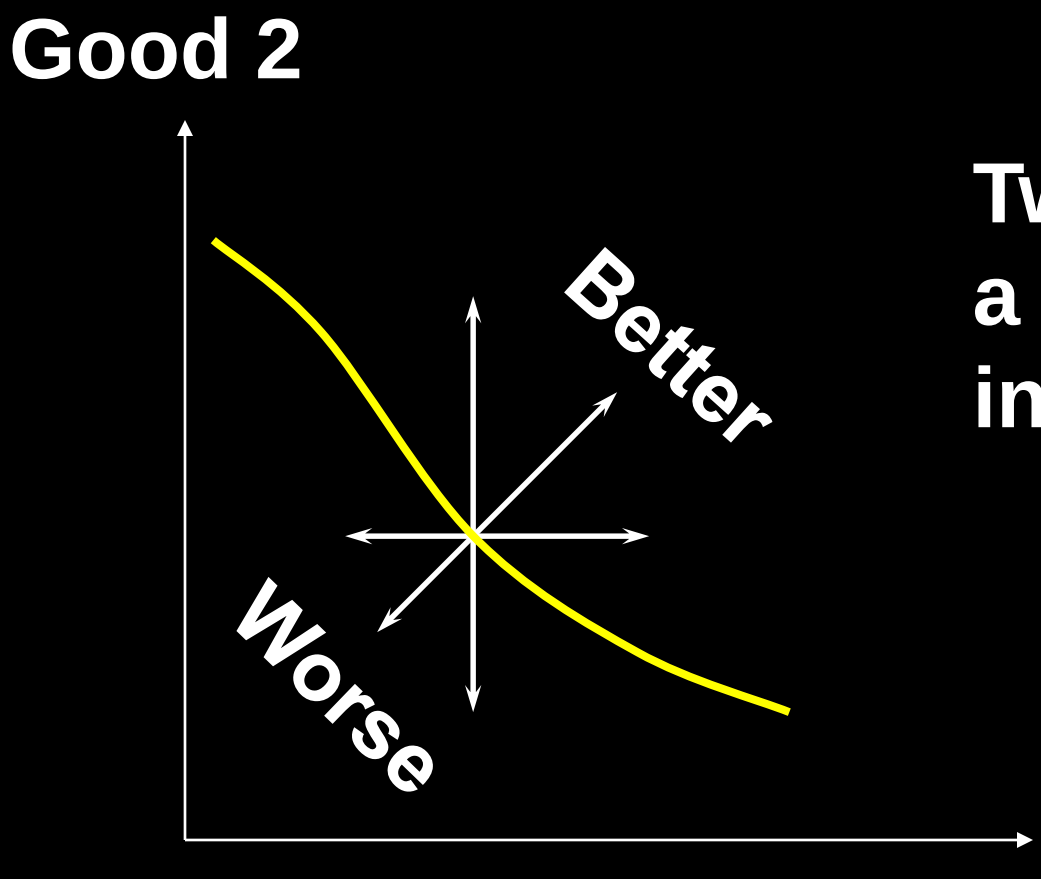
From I_1, $x \sim y$. From I_2, $x \sim z$. Therefore $y \sim z$. But from I_1 and I_2 we see $y \succ z$, a contradiction.

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

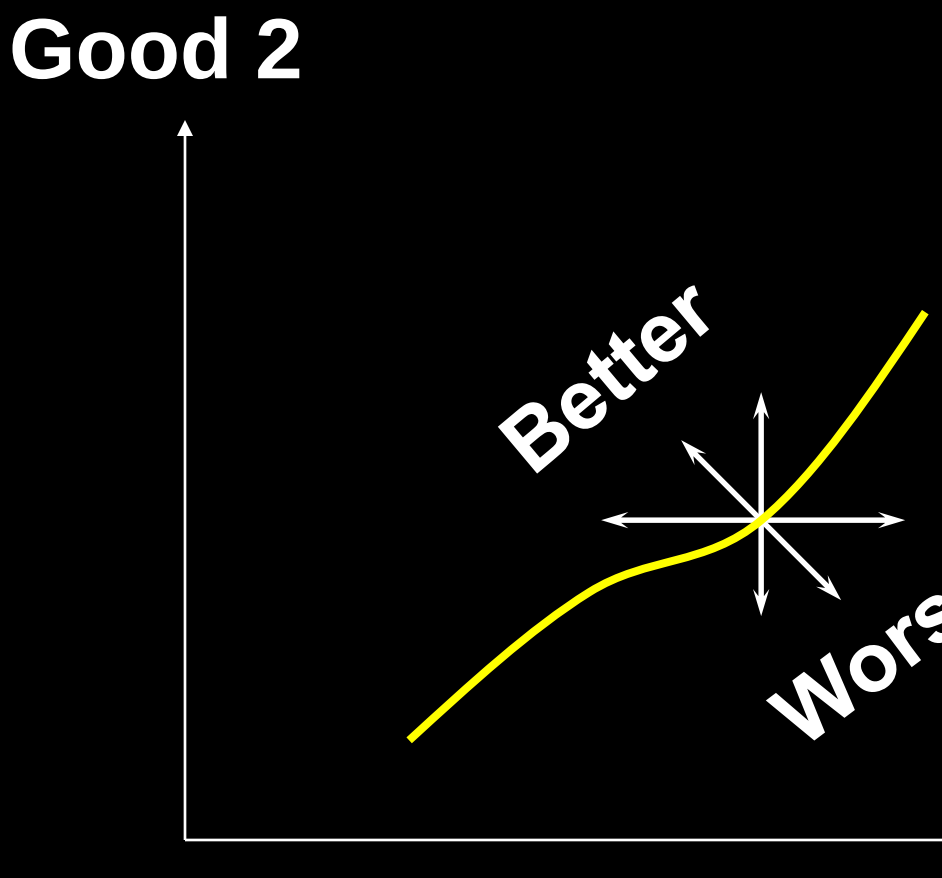


Two goods ➡ a negatively sloped indifference curve.

Slopes of Indifference Curves

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

Slopes of Indifference Curves

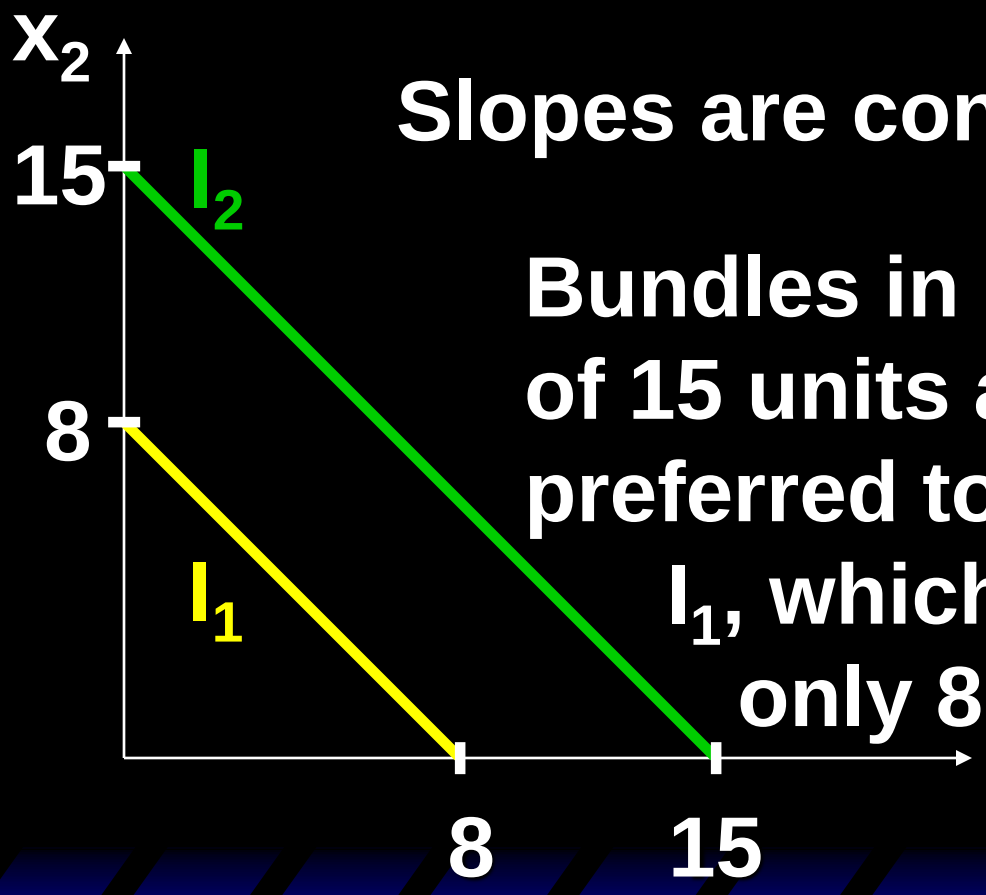


One good and one bad → a positively sloped indifference curve.

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



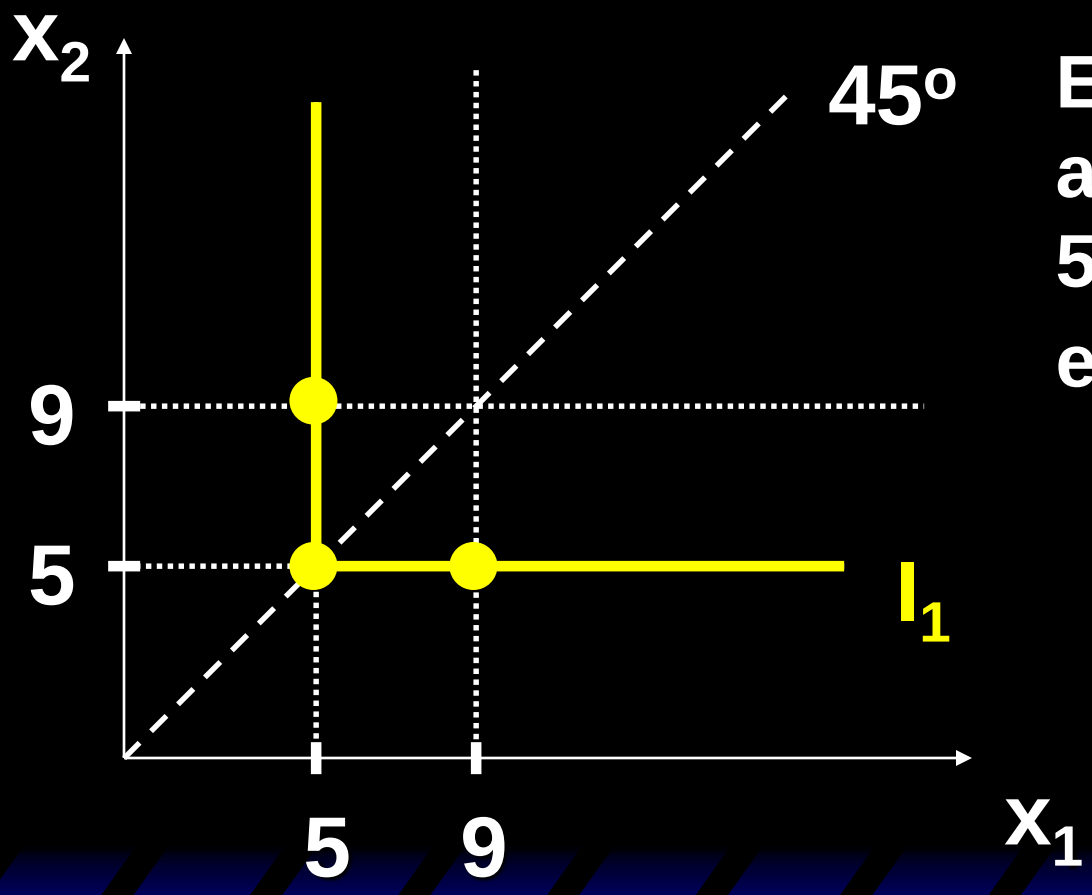
Slopes are constant at - 1.

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

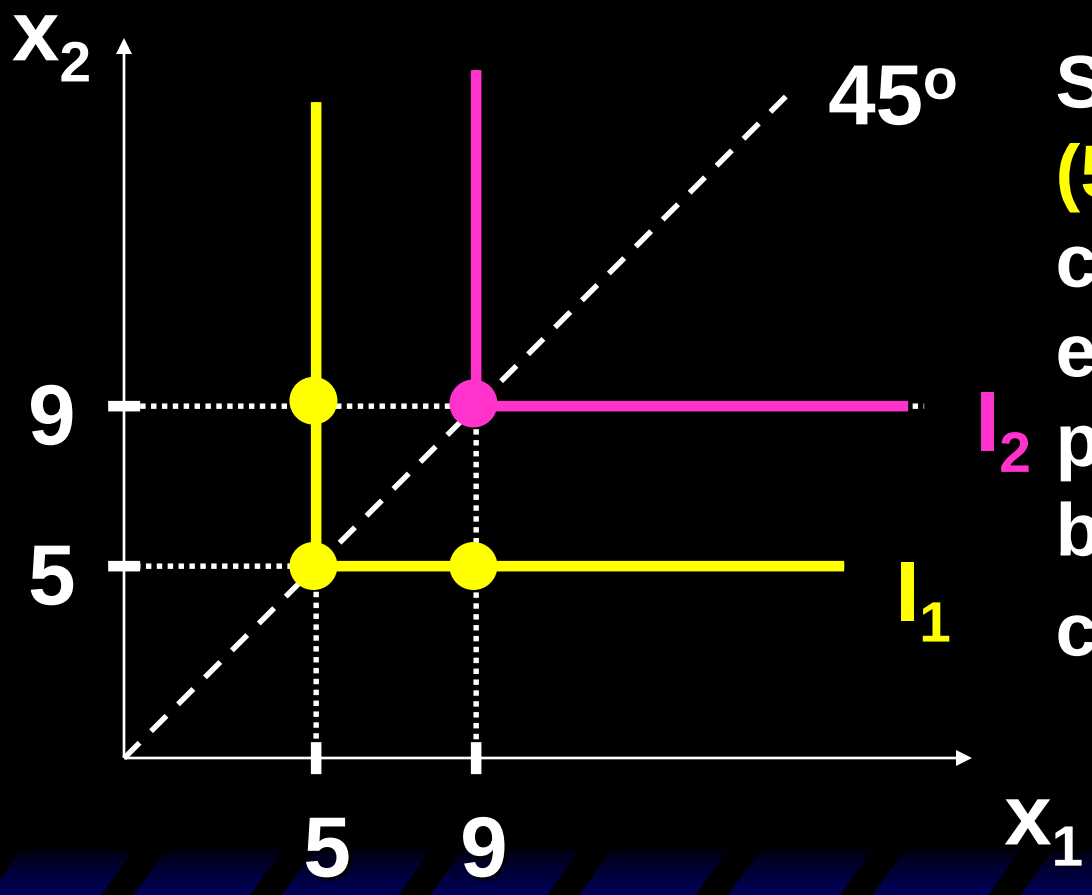
If a consumer always consumes commodities 1 and 2 in fixed proportion (e.g. one-to-one), then the commodities are perfect complements and only the number of pairs of units of the two commodities determines the preference rank-order of bundles.

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



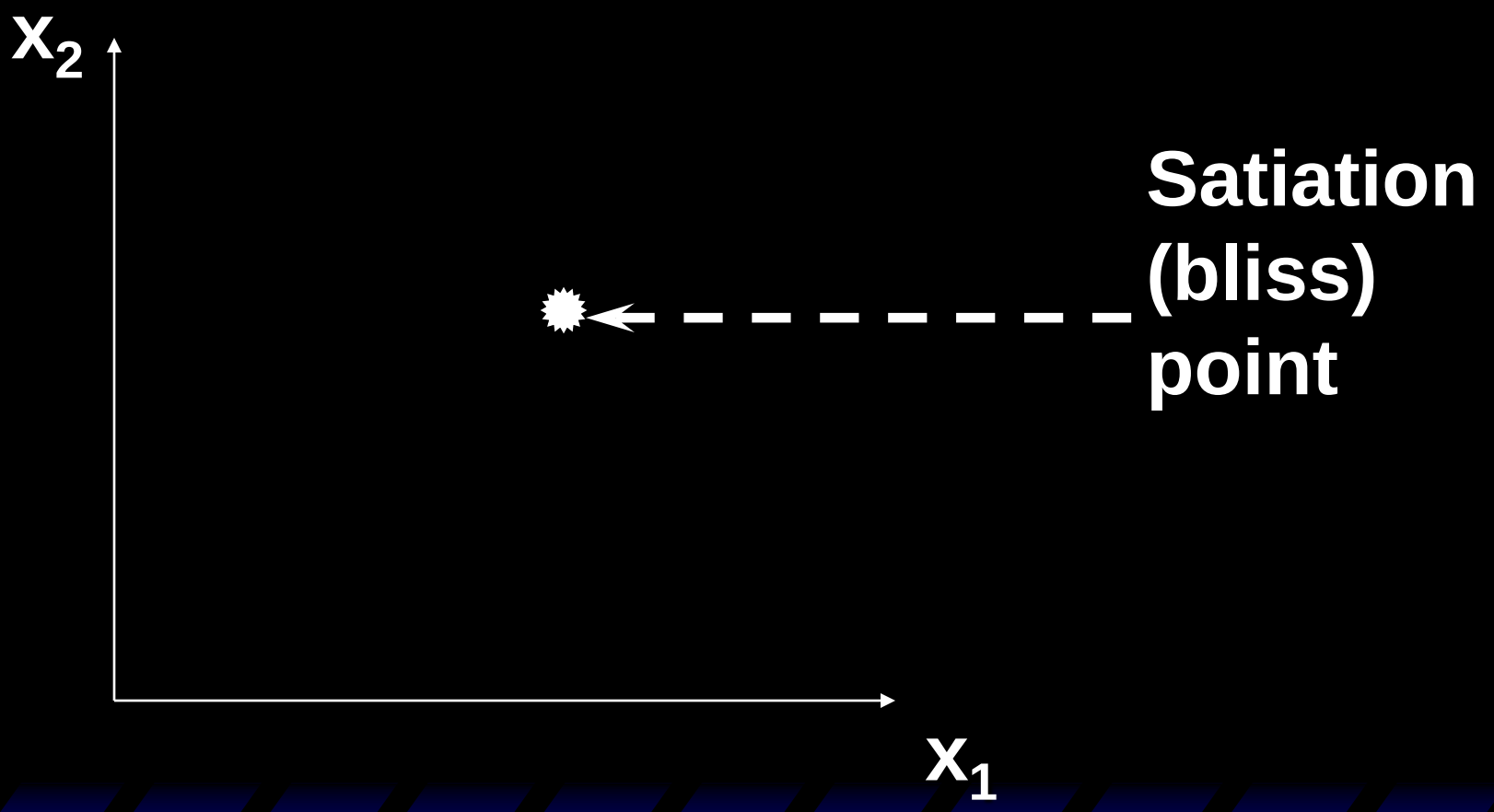
Since each of (5,5), (5,9) and (9,5) contains 5 pairs, each is less preferred than the bundle (9,9) which contains 9 pairs.

Preferences Exhibiting Satiation

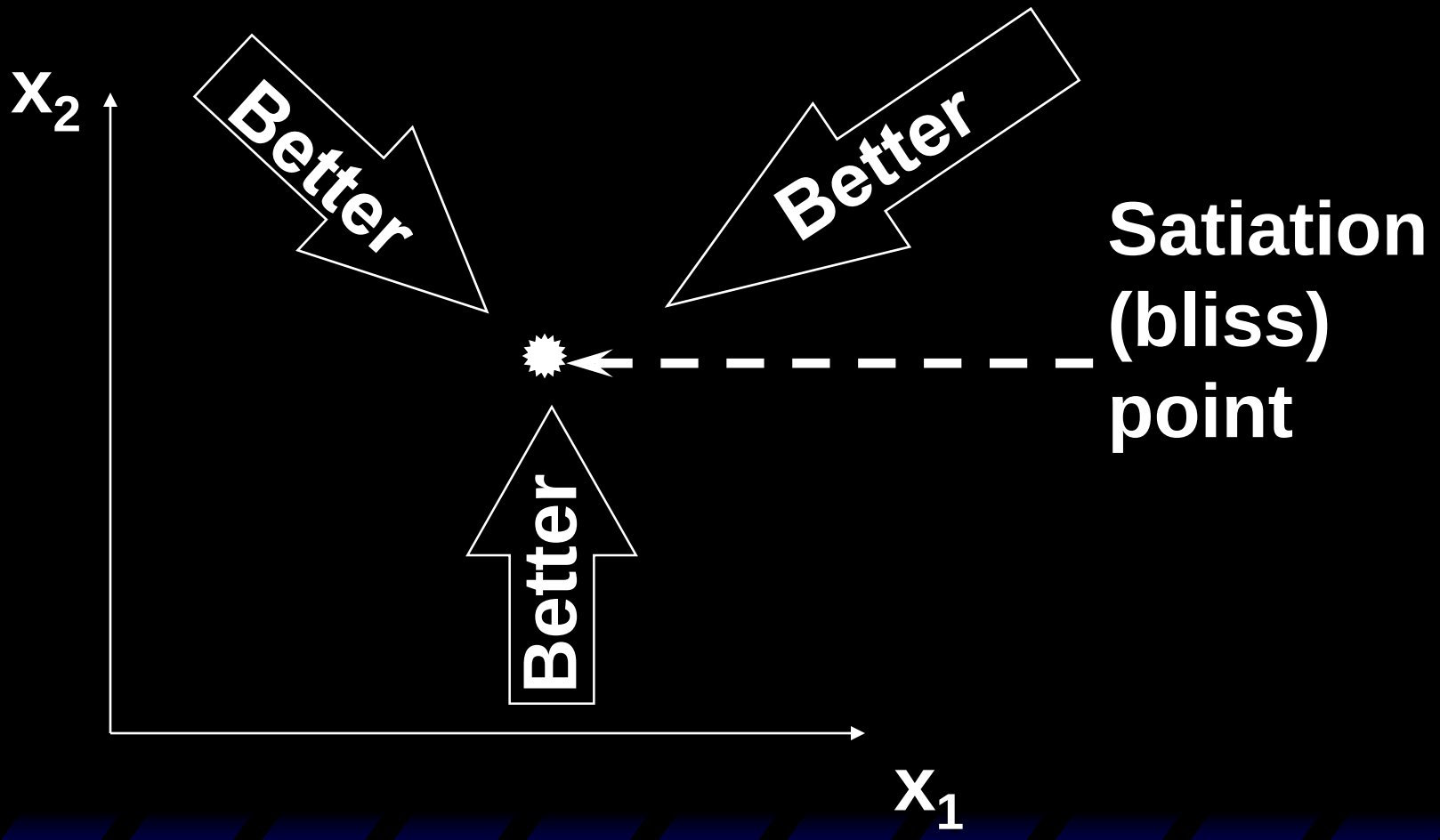
A bundle strictly preferred to any other is a satiation point or a bliss point.

What do indifference curves look like for preferences exhibiting satiation?

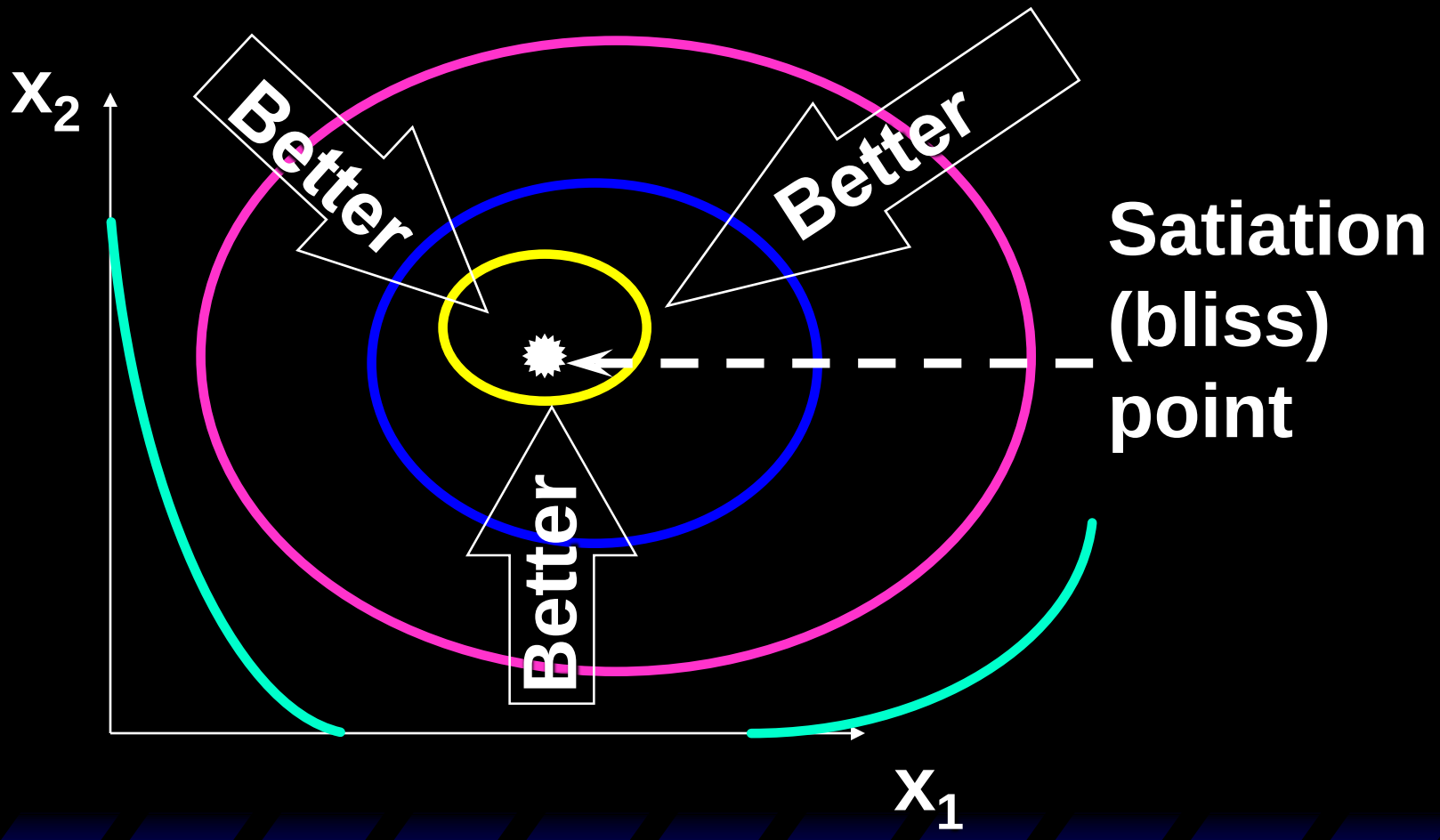
Indifference Curves Exhibiting Satiation



Indifference Curves Exhibiting Satiation



Indifference Curves Exhibiting Satiation



Indifference Curves for Discrete Commodities

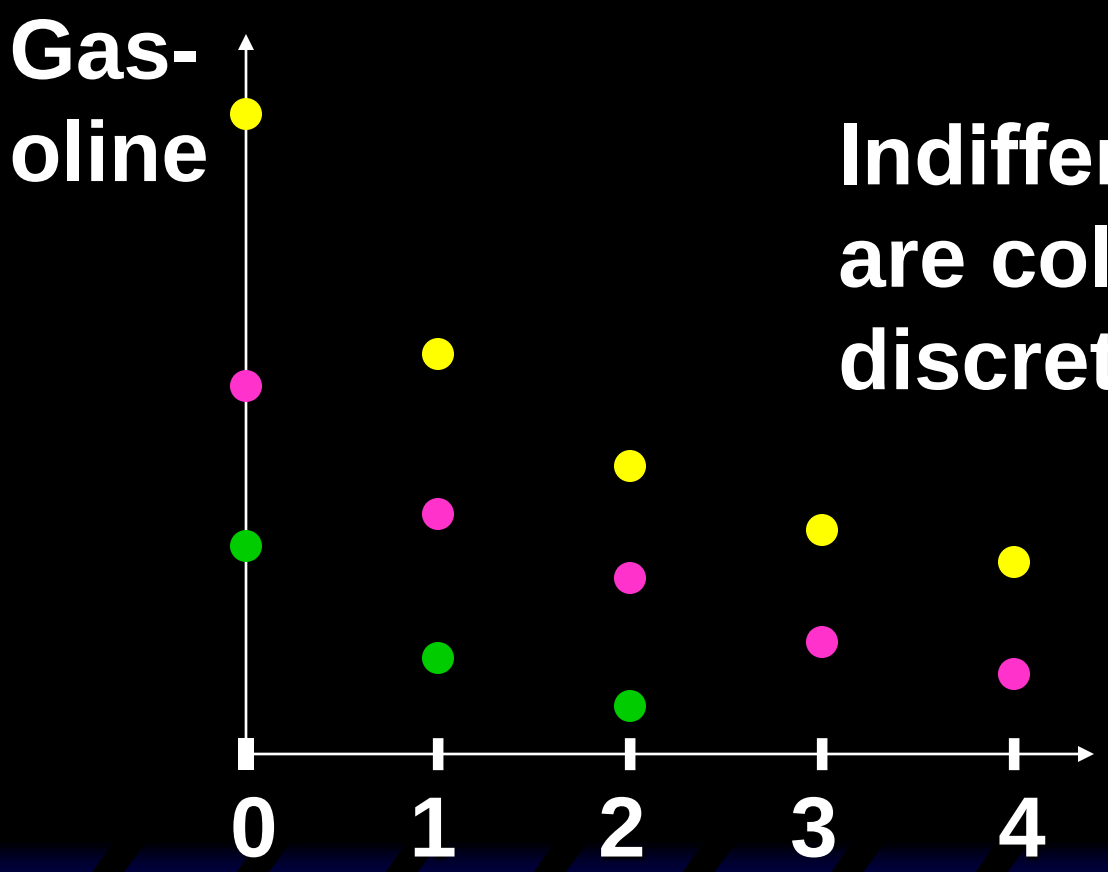
A commodity is infinitely divisible if it can be acquired in any quantity; *e.g.* water or cheese.

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).

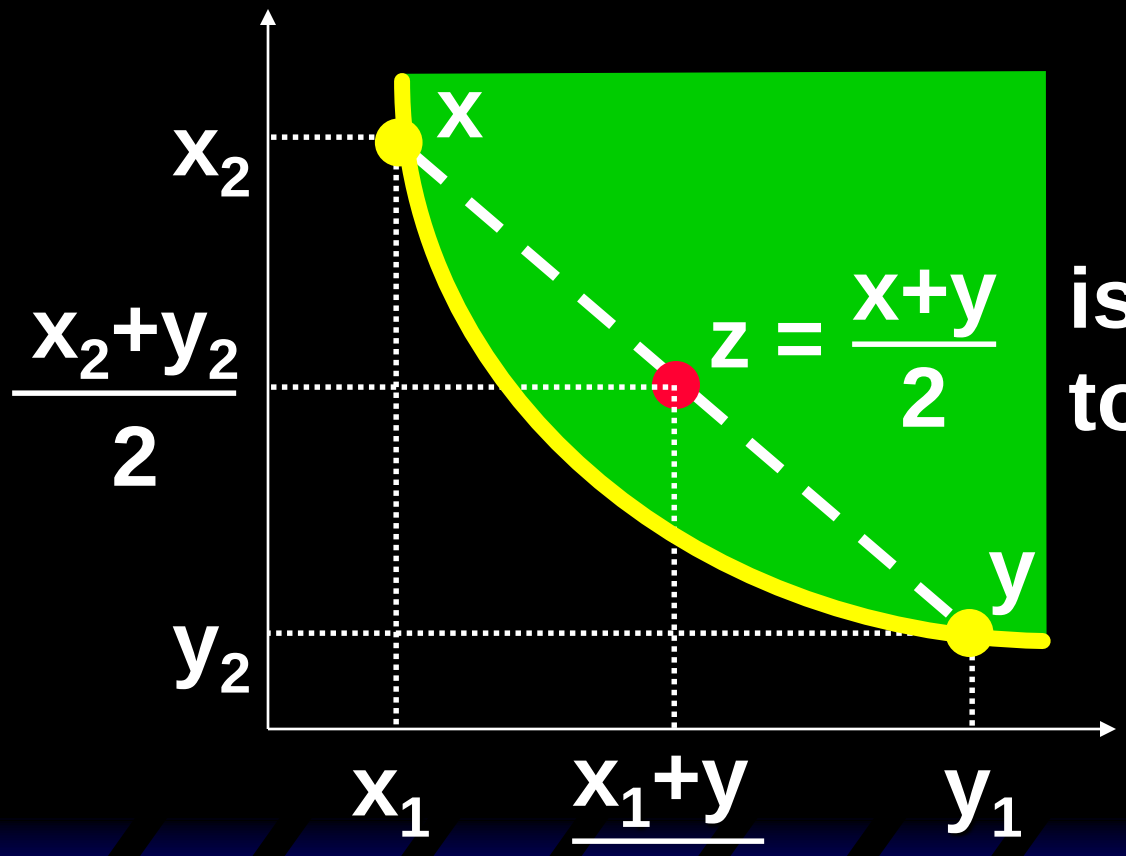
Well-Behaved Preferences

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

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

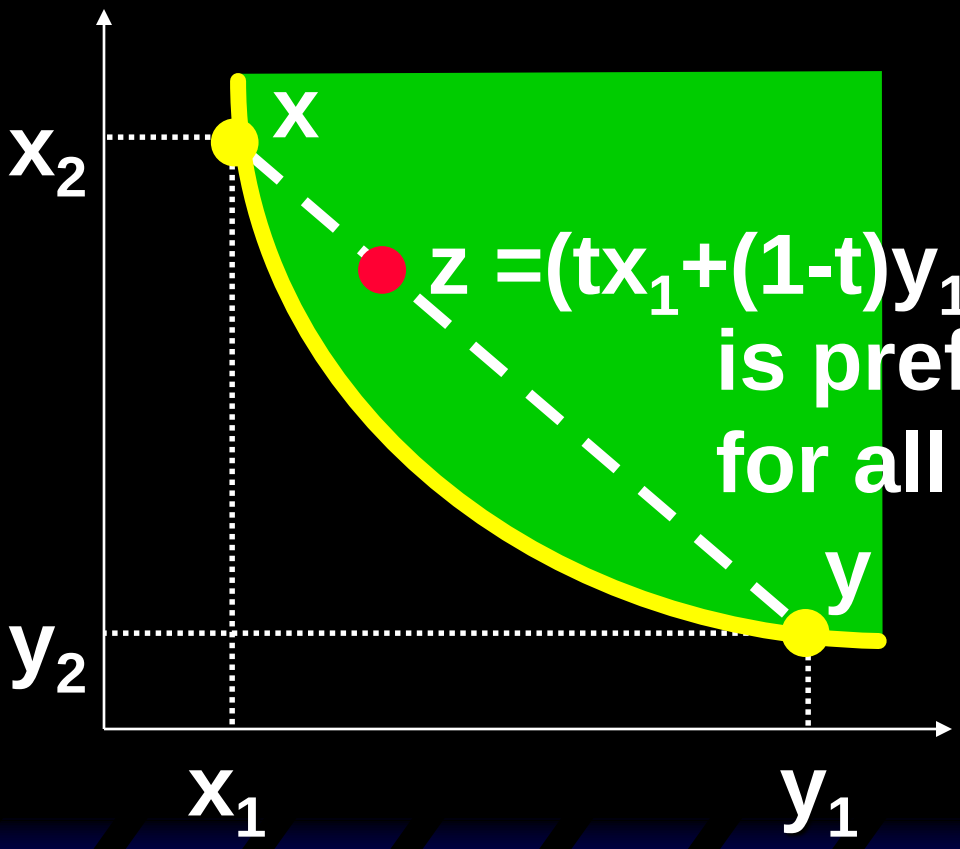
z is at least as preferred as x or y.

Well-Behaved Preferences -- Convexity.

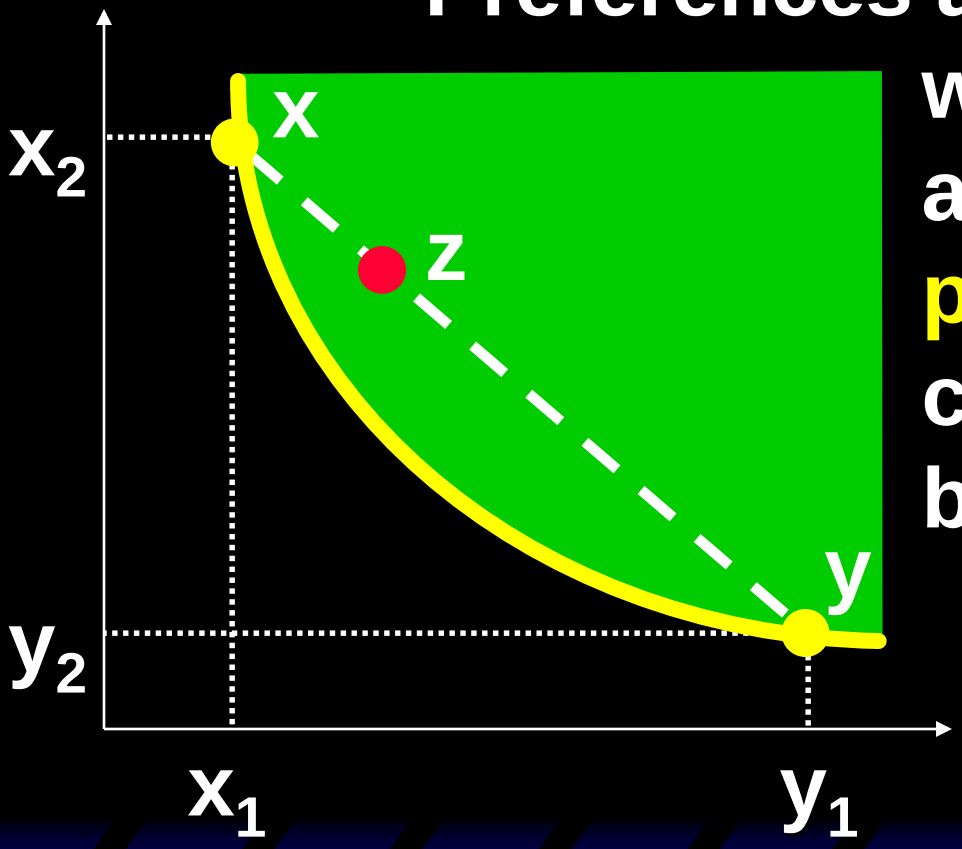


is strictly preferred to both x and y.

Well-Behaved Preferences -- Convexity.

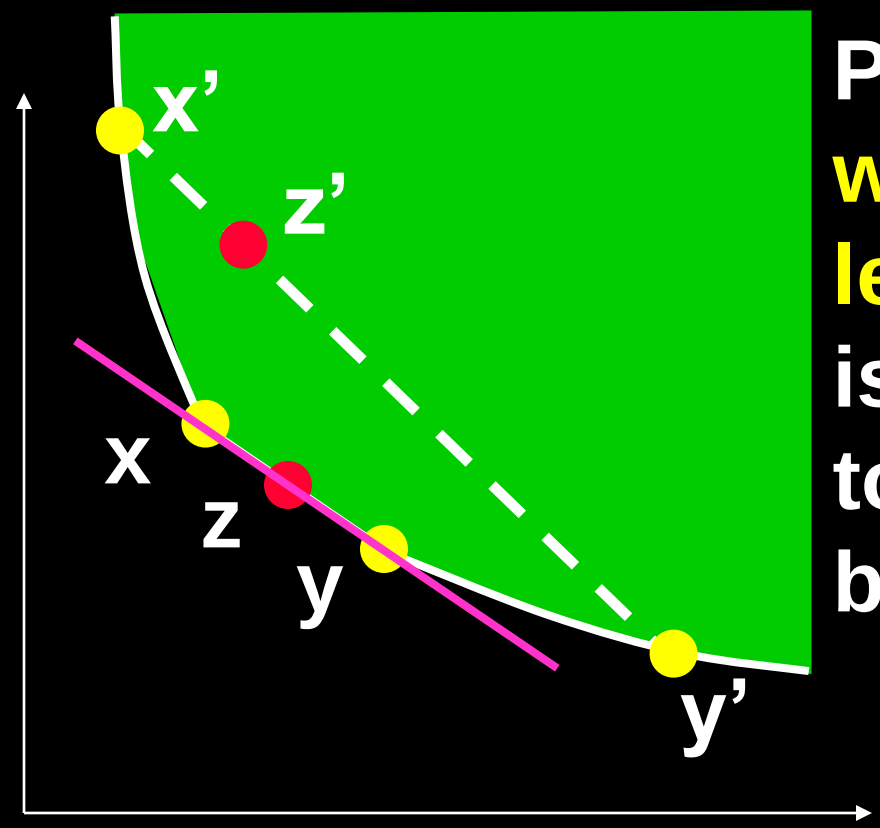


Well-Behaved Preferences -- Convexity.



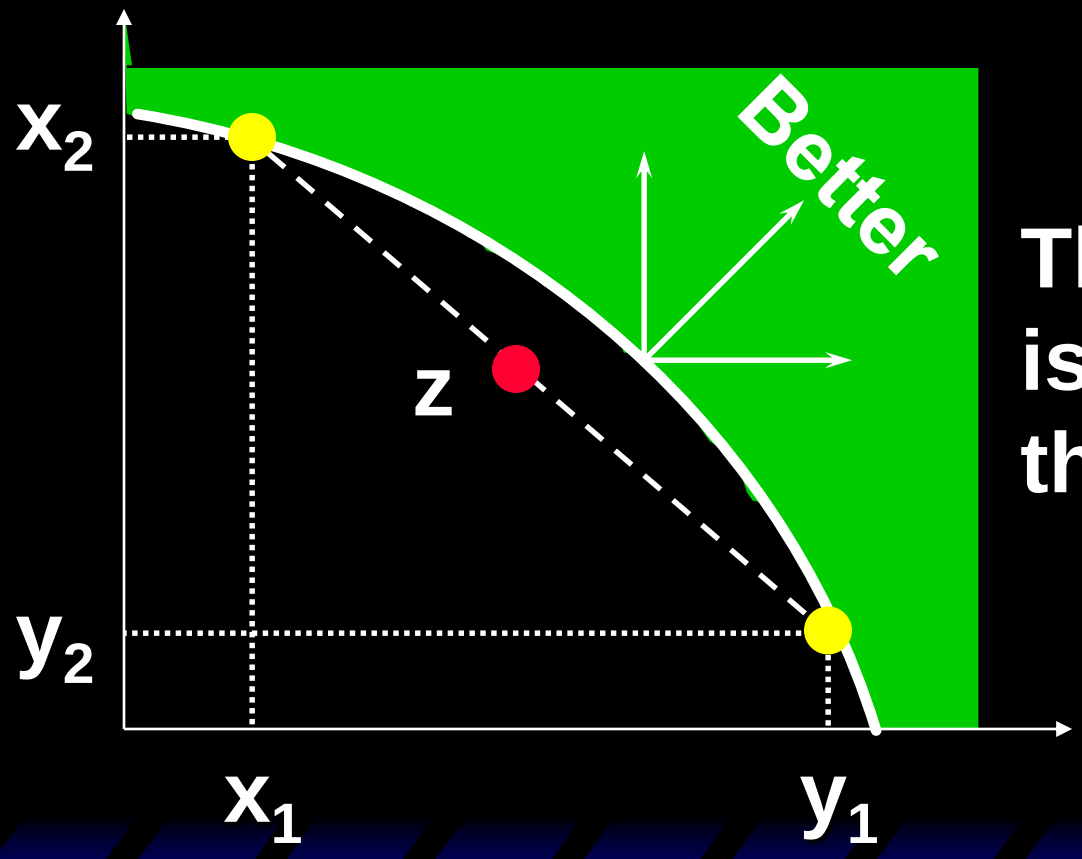
Preferences are strictly convex when all mixtures z are strictly preferred to their component bundles x and y.

Well-Behaved Preferences -- Weak Convexity.



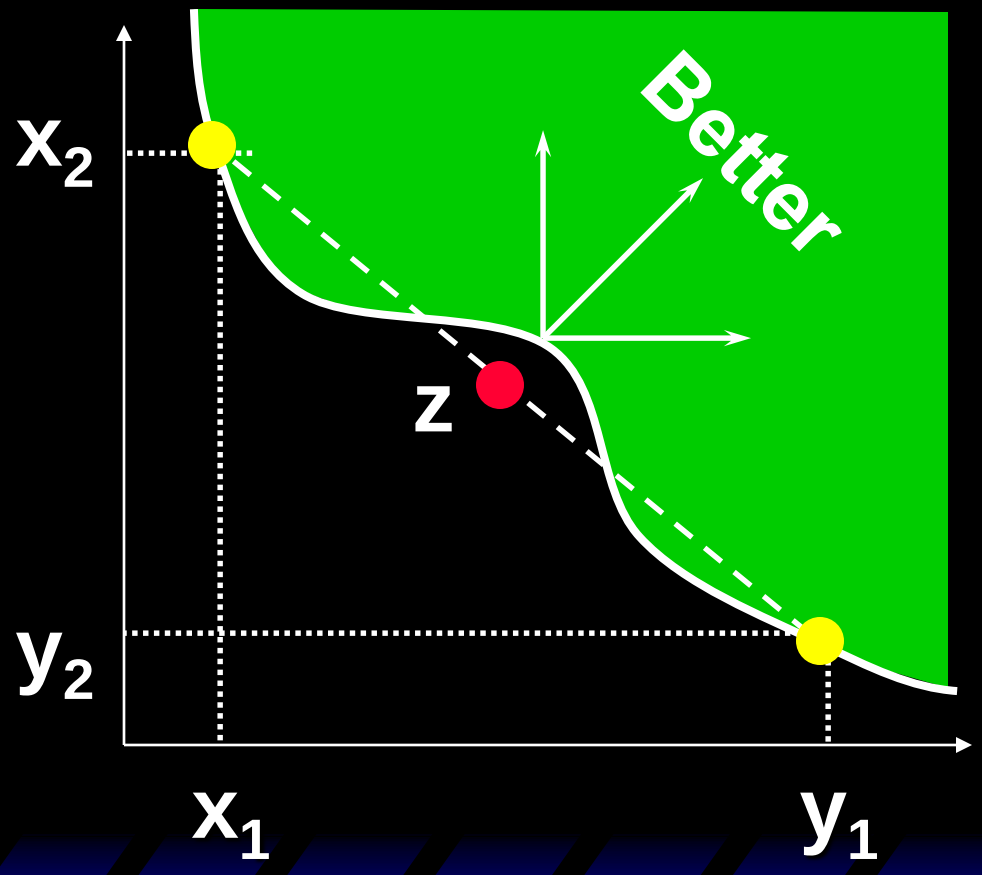
Preferences are weakly convex if at least one mixture z is equally preferred to a component bundle.

Non-Convex Preferences



The mixture z is less preferred than x or y.

More Non-Convex Preferences



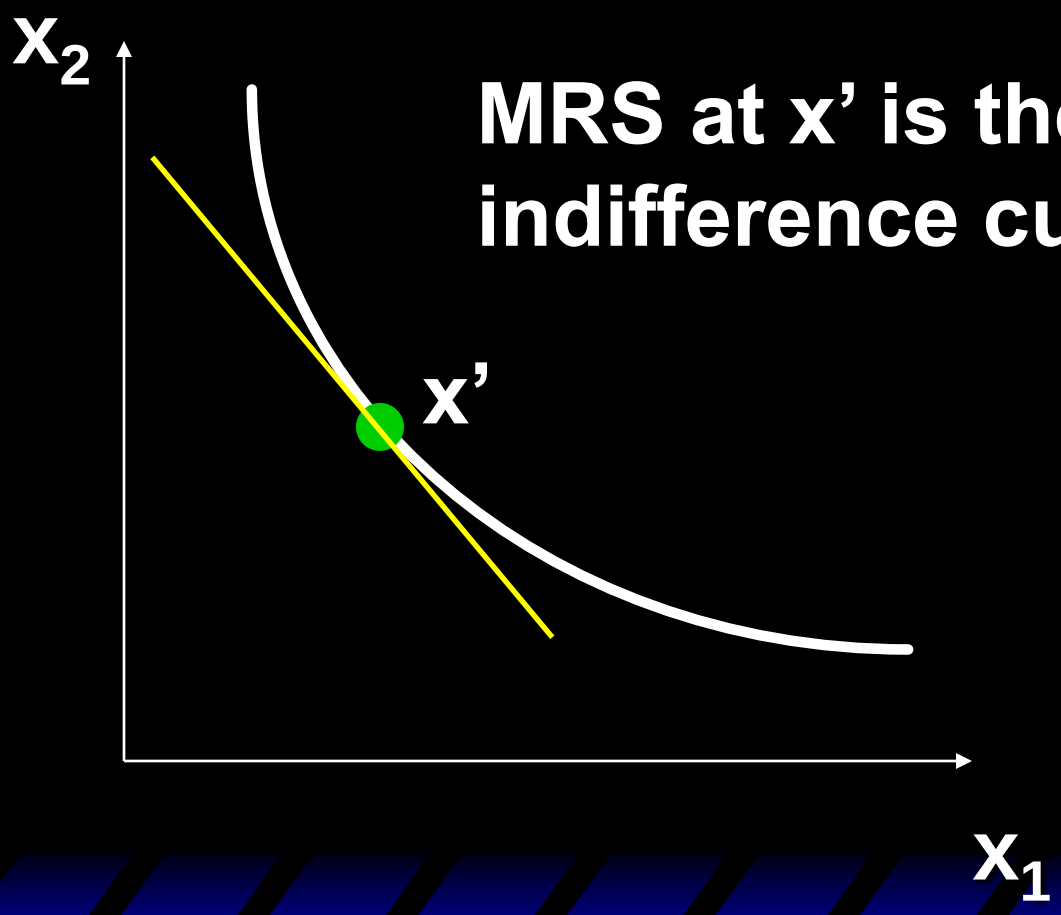
The mixture z is less preferred than x or y.

Slopes of Indifference Curves

The slope of an indifference curve is its marginal rate-of-substitution (MRS).

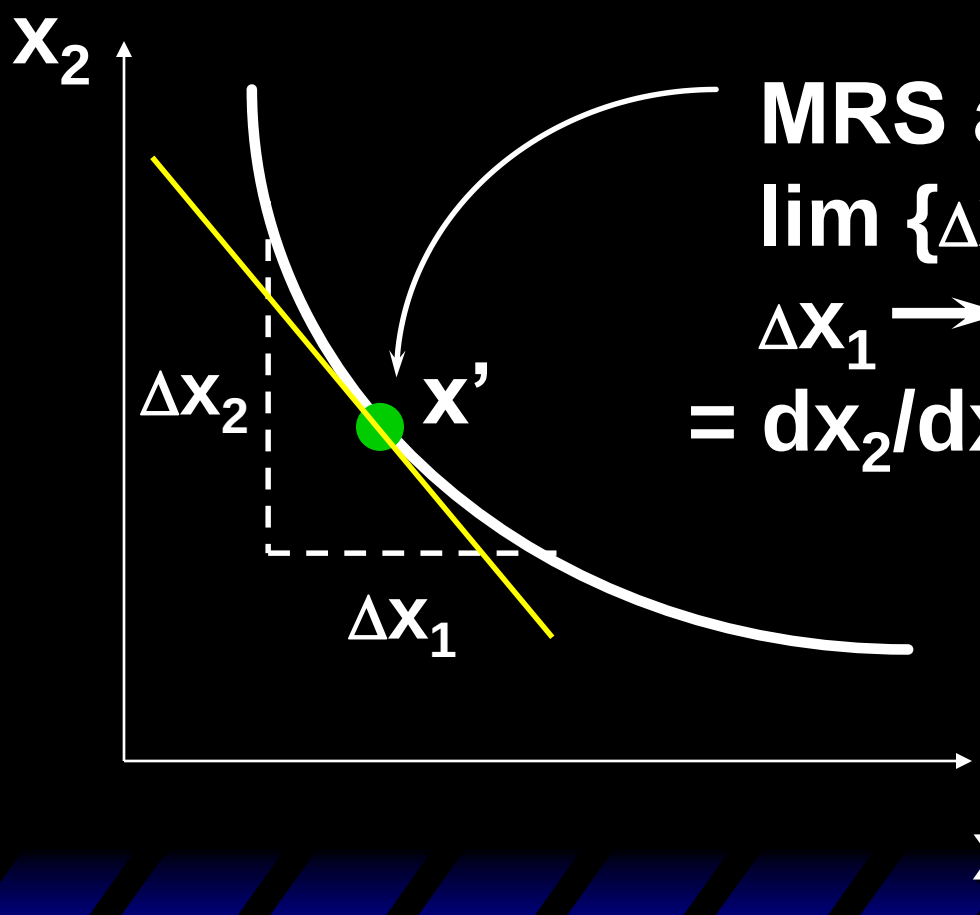
How can a MRS be calculated?

Marginal Rate of Substitution



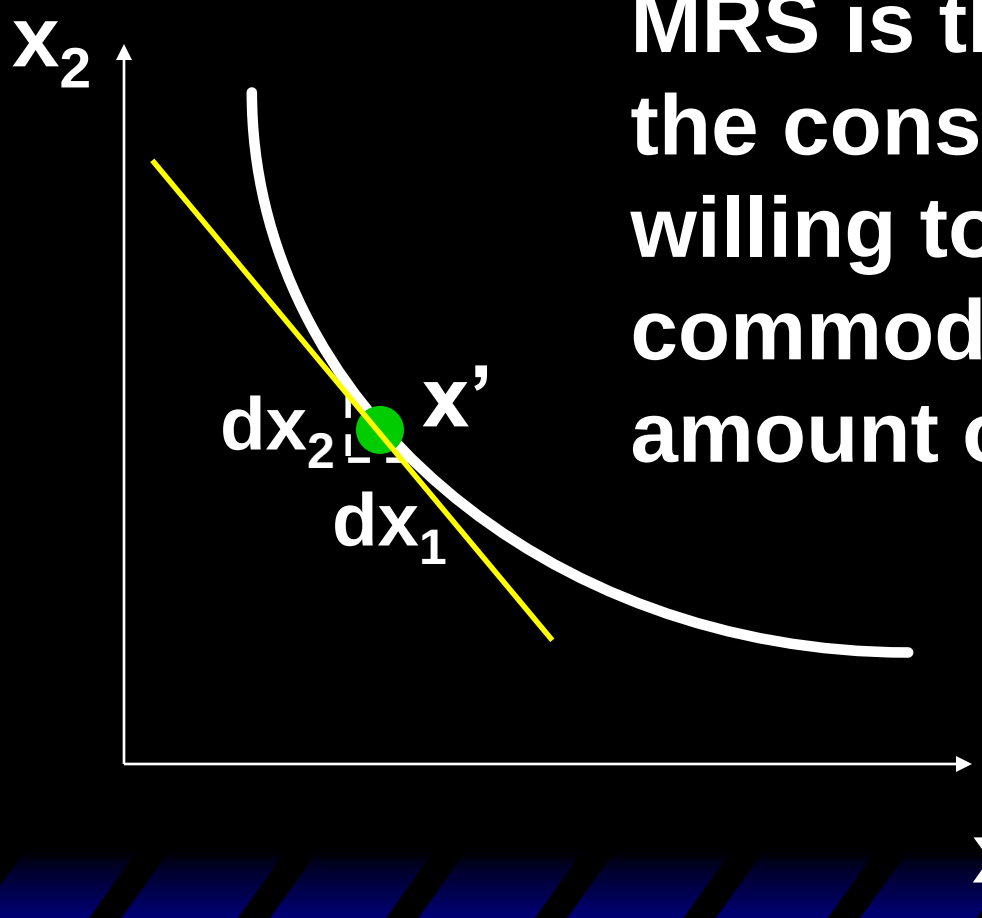
MRS at x' is the slope of the indifference curve at x'

Marginal Rate of Substitution



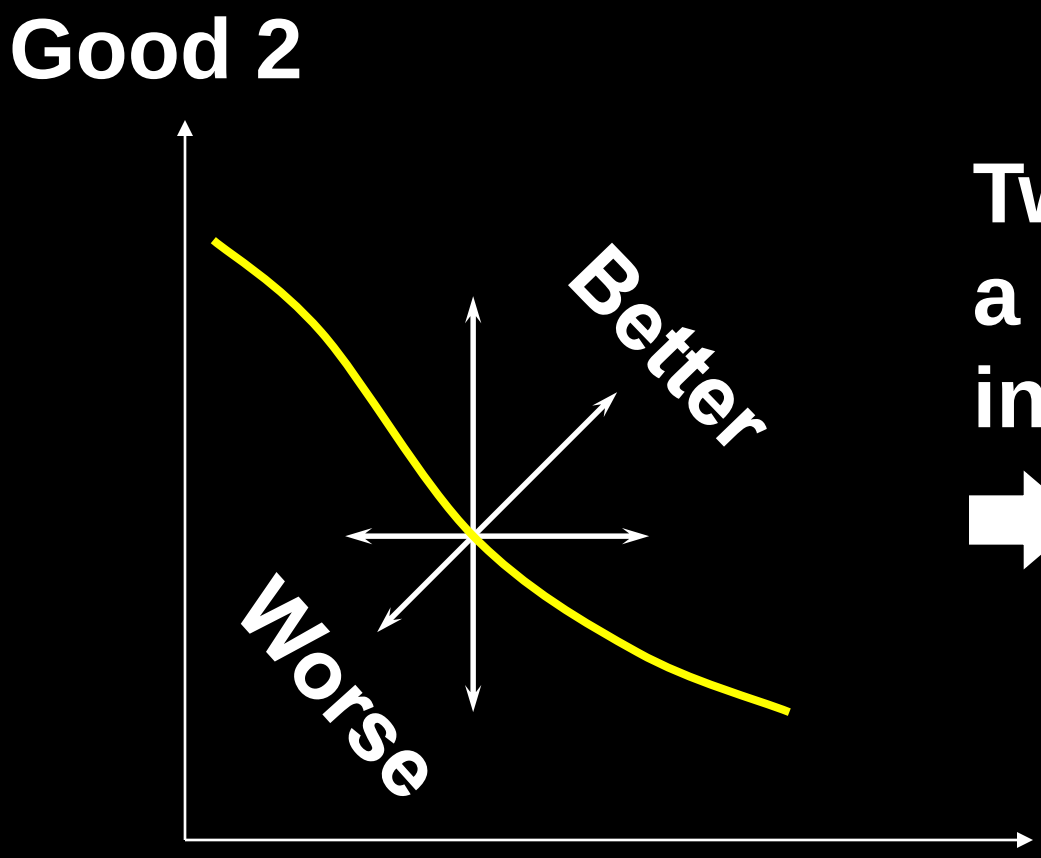
MRS at x' is
$\lim \{\Delta x_2/\Delta x_1\}$
$\Delta x_1 \rightarrow 0$
$= dx_2/dx_1$ at x'

Marginal Rate of Substitution



dx_2 = MRS ´ 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.

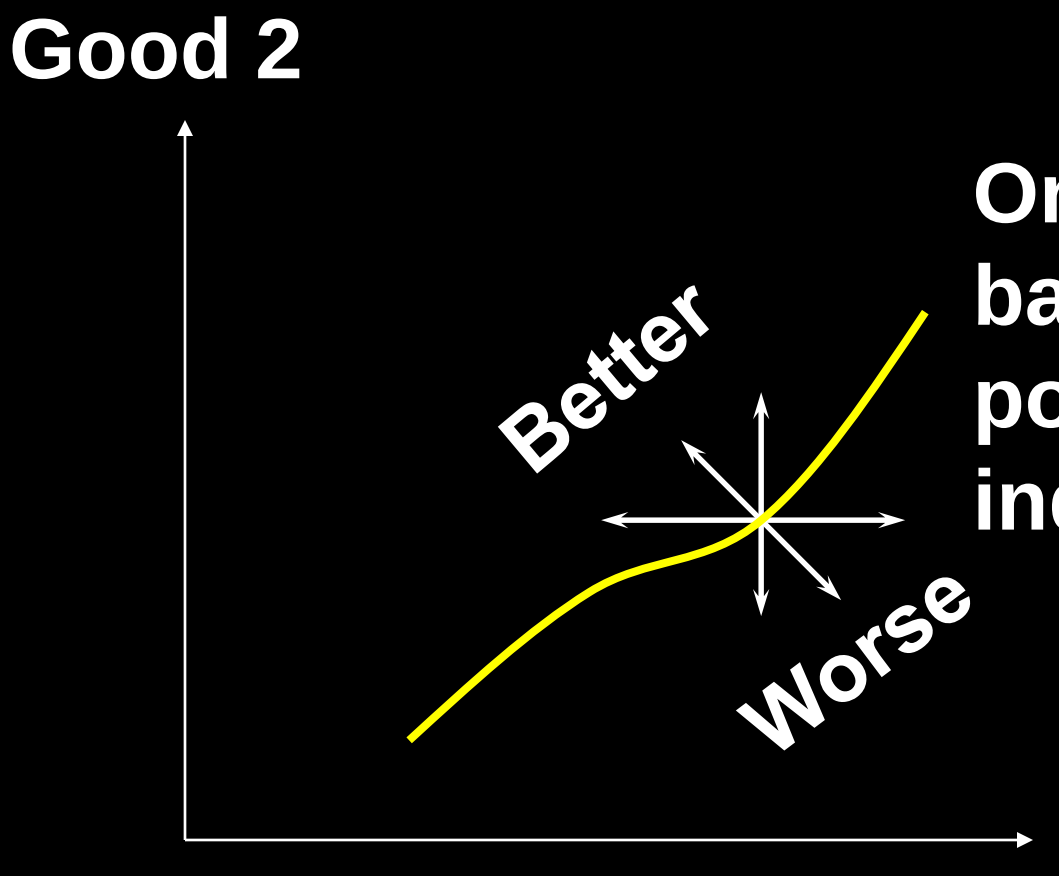
MRS & Ind. Curve Properties



Two goods ➡ a negatively sloped indifference curve

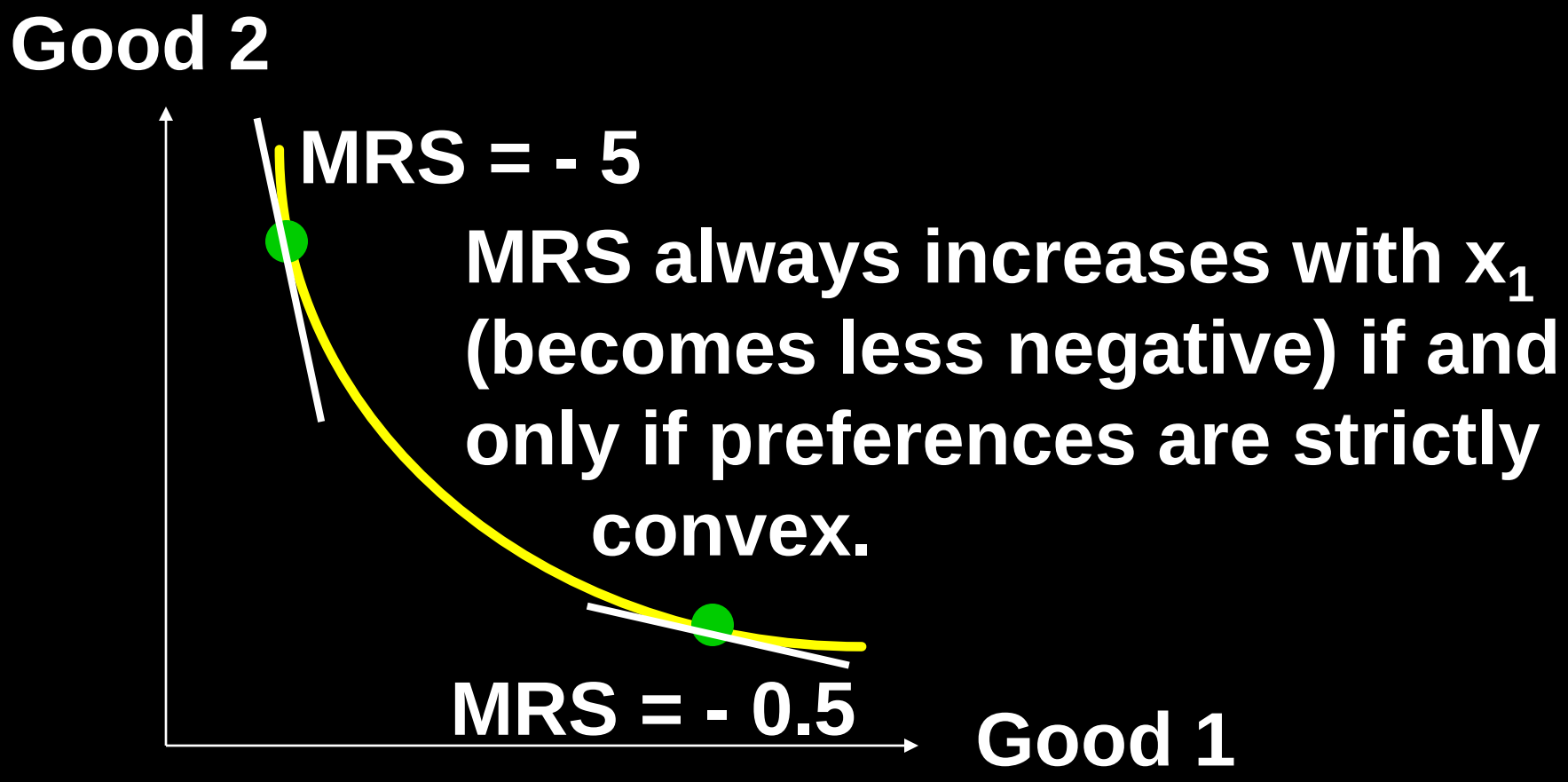
➡ MRS < 0.

MRS & Ind. Curve Properties

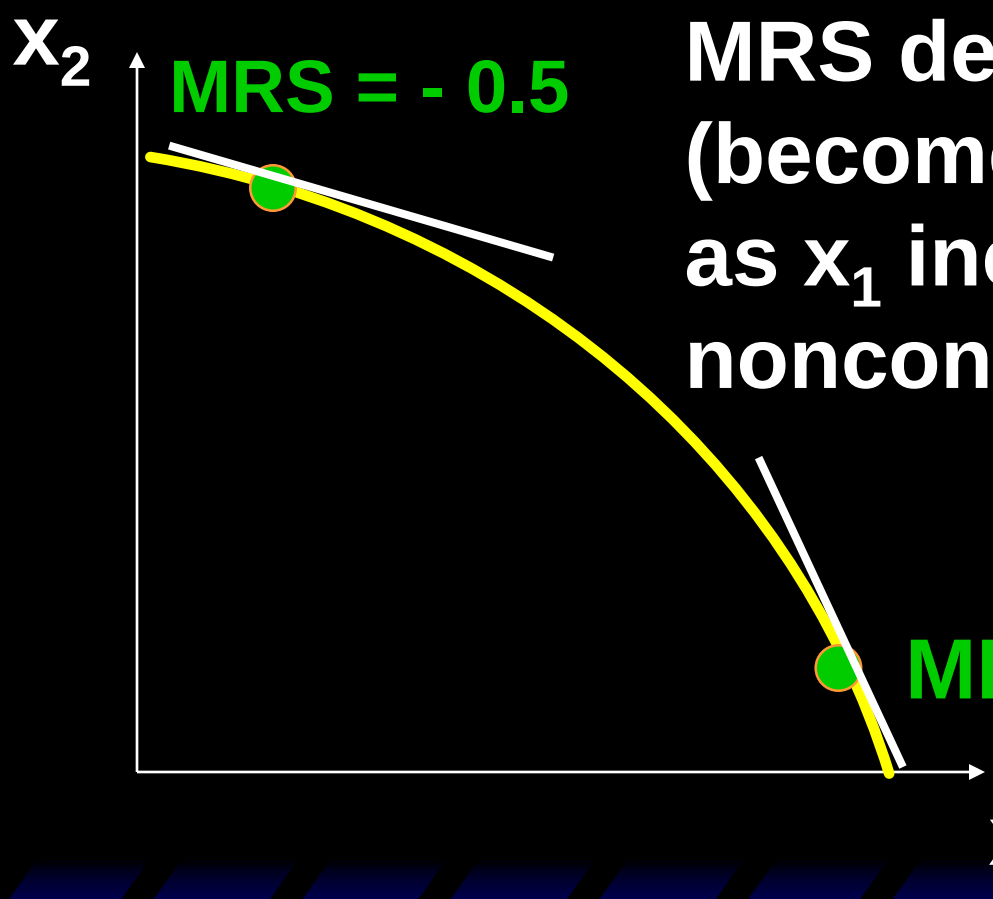


One good and one bad → a positively sloped indifference curve → MRS > 0.

MRS & Ind. Curve Properties



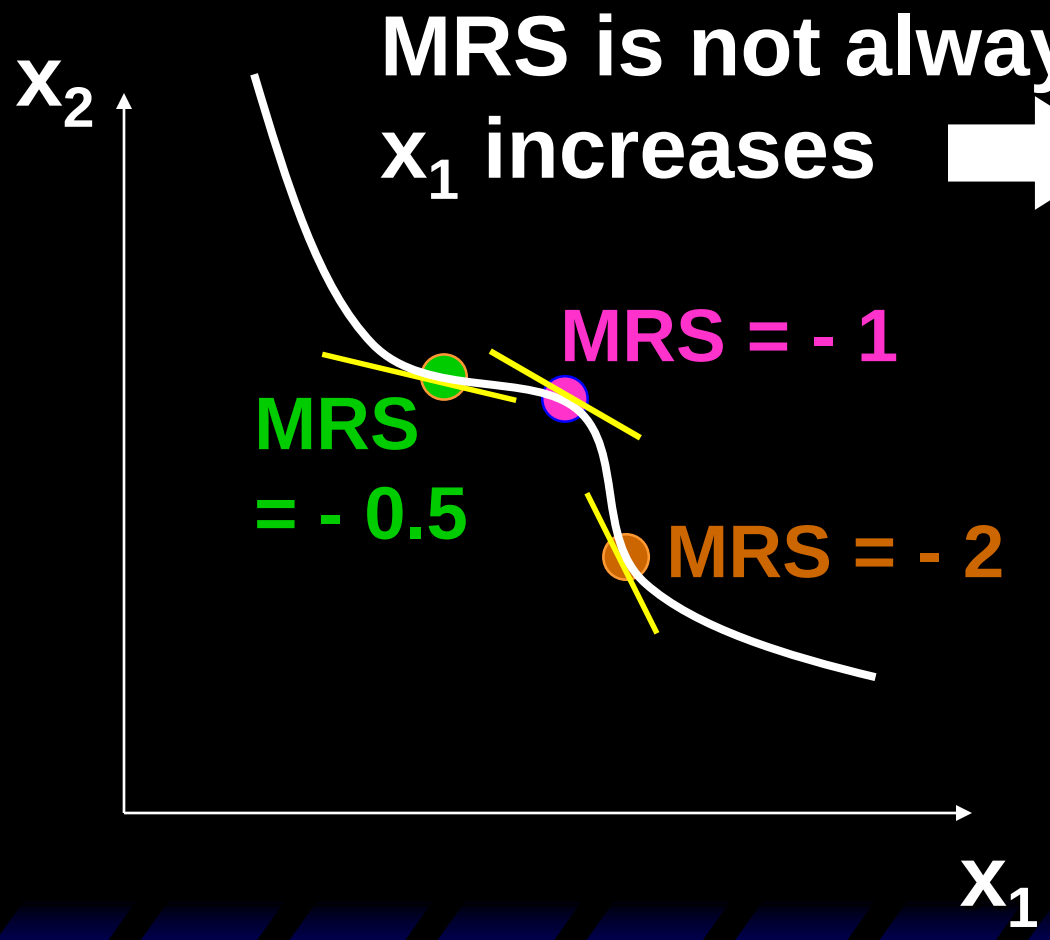
MRS & Ind. Curve Properties



MRS decreases (becomes more negative) as x_1 increases

nonconvex preferences

MRS & Ind. Curve Properties



MRS is not always increasing as x_1 increases ⇒ **nonconvex preferences.**