



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.

- **Consumption bundle** – object of consumer choice.
- Consumption bundle – complete list of goods and services, the consumer can choose from.
- When, where and under what circumstances matter

- **Consumption bundle** X consists of x_1, x_2, \dots, x_n goods and services
For simplicity assume – X consists of only 2 goods: x_1, x_2

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

- **d** denotes strict preference;
 $x \text{ d } y$ means that bundle **x** is preferred strictly to bundle **y**.

Preference Relations

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

Preference Relations

- **d denotes strict preference so $x d y$ means that bundle x is preferred strictly to bundle y .**
- **\sim denotes indifference; $x \sim y$ means x and y are equally preferred.**
- **\underline{f} denotes weak preference; $x \underline{f} y$ means x is preferred at least as much as is y .**

Preference Relations

- $x \precsim y$ and $y \precsim x$ imply $x \sim y$.

Preference Relations

- $x \precsim y$ and $y \precsim x$ imply $x \sim y$.
- $x \precsim y$ and (not $y \precsim x$) imply $x \prec y$.

Assumptions about Preference Relations

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

$$x \preceq y$$

or

$$y \preceq x.$$

Can you always tell what you choose?

Sophia's choice

Assumptions about Preference Relations

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

$$x \preceq x.$$

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.*

$$x \succeq y \text{ and } y \succeq z \longrightarrow x \succeq z.$$

Transitivity –an experiment

- **Imagine you are hungry.**
- **During the break you may have**
- **What would you choose?**

Write the first letter in the table given to you and bend the row, so that you can not see the previous choices



Transitivity –an experiment

1. Apple vs. Banana

Transitivity –an experiment

2. Banana vs. Cake

Transitivity –an experiment

3. Cake vs. Sandwich with Ham

Transitivity –an experiment

4. Sandwich with Ham vs. Sandwich with Cheese

Transitivity –an experiment

5. Apple vs. Cake

Transitivity –an experiment

6. Apple vs. Sandwich with Cheese

Transitivity –an experiment

7. Apple vs. Sandwich with Ham

Transitivity –an experiment

8. Banana vs. Sandwich with Ham

Transitivity –an experiment

9. Banana vs. Sandwich with Cheese

Transitivity –an experiment

10. Cake vs. Sandwich with Cheese

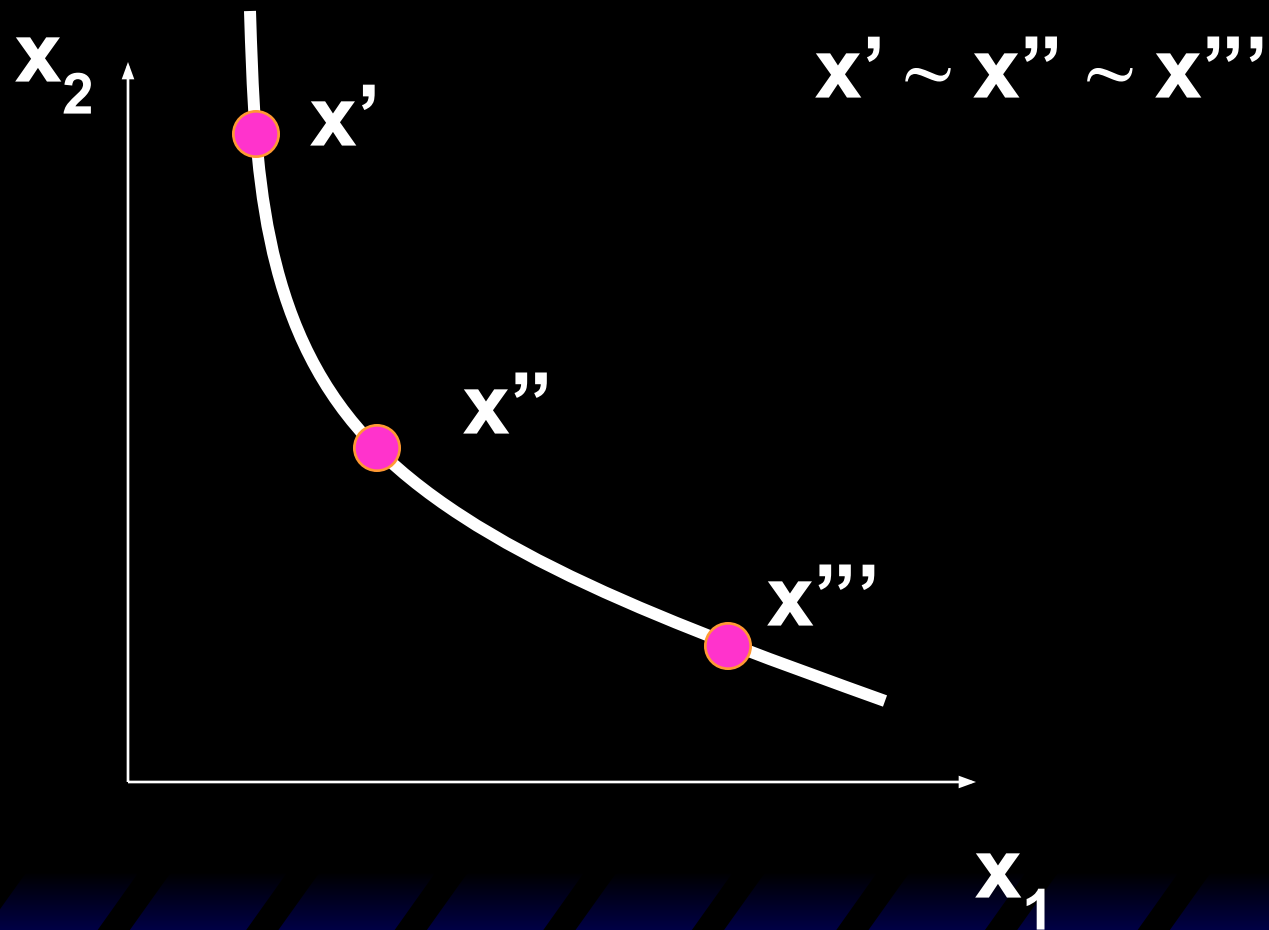
Assumptions about Preference Relations

- **Transitivity is a hypothesis about people's choice behaviour – not a statement of pure logic!**
- **We have to assume preferences are transitive to have a theory of how people make best choices**

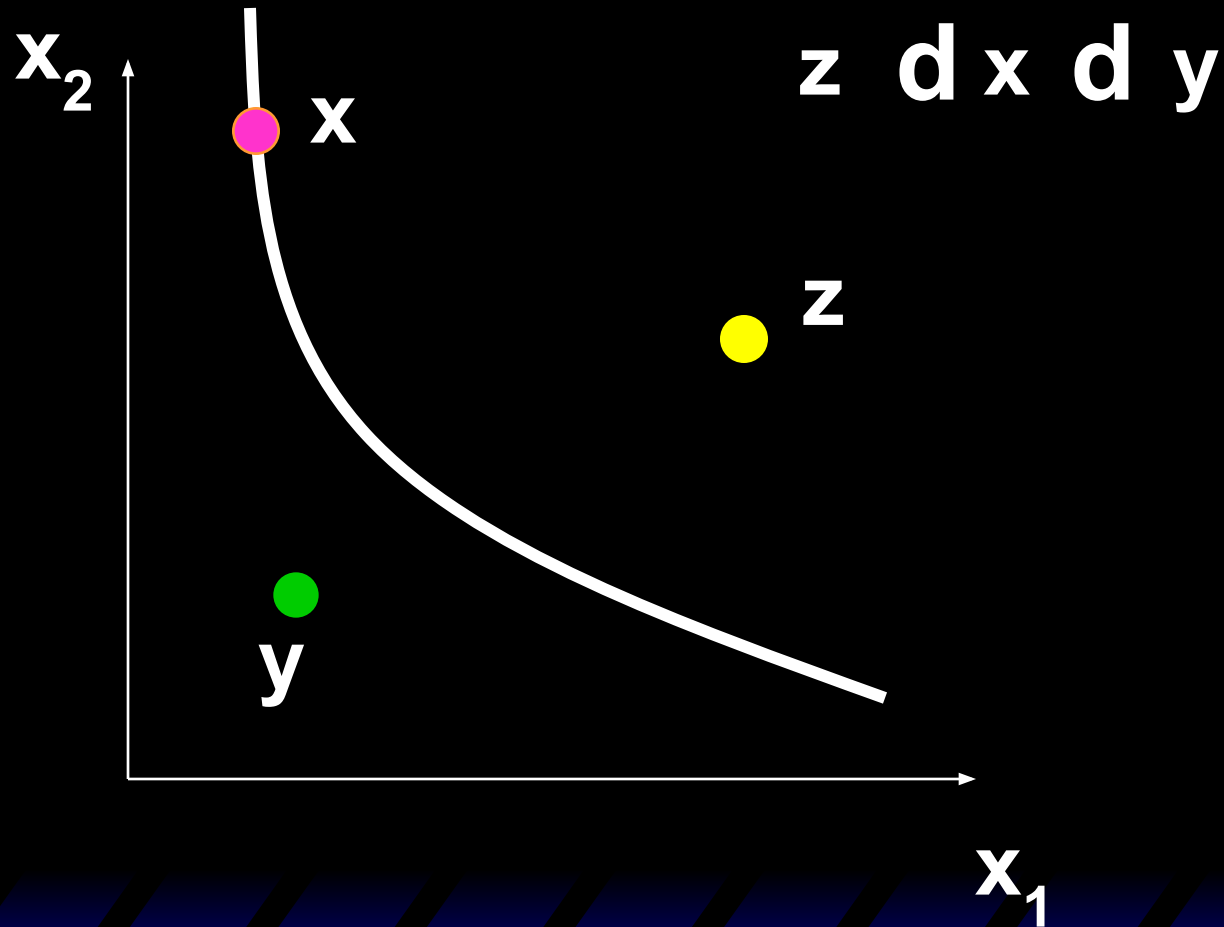
Indifference Curves

- 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 $y \sim x'$.
- Since an indifference “curve” is not always a curve a better name might be an indifference “set”.

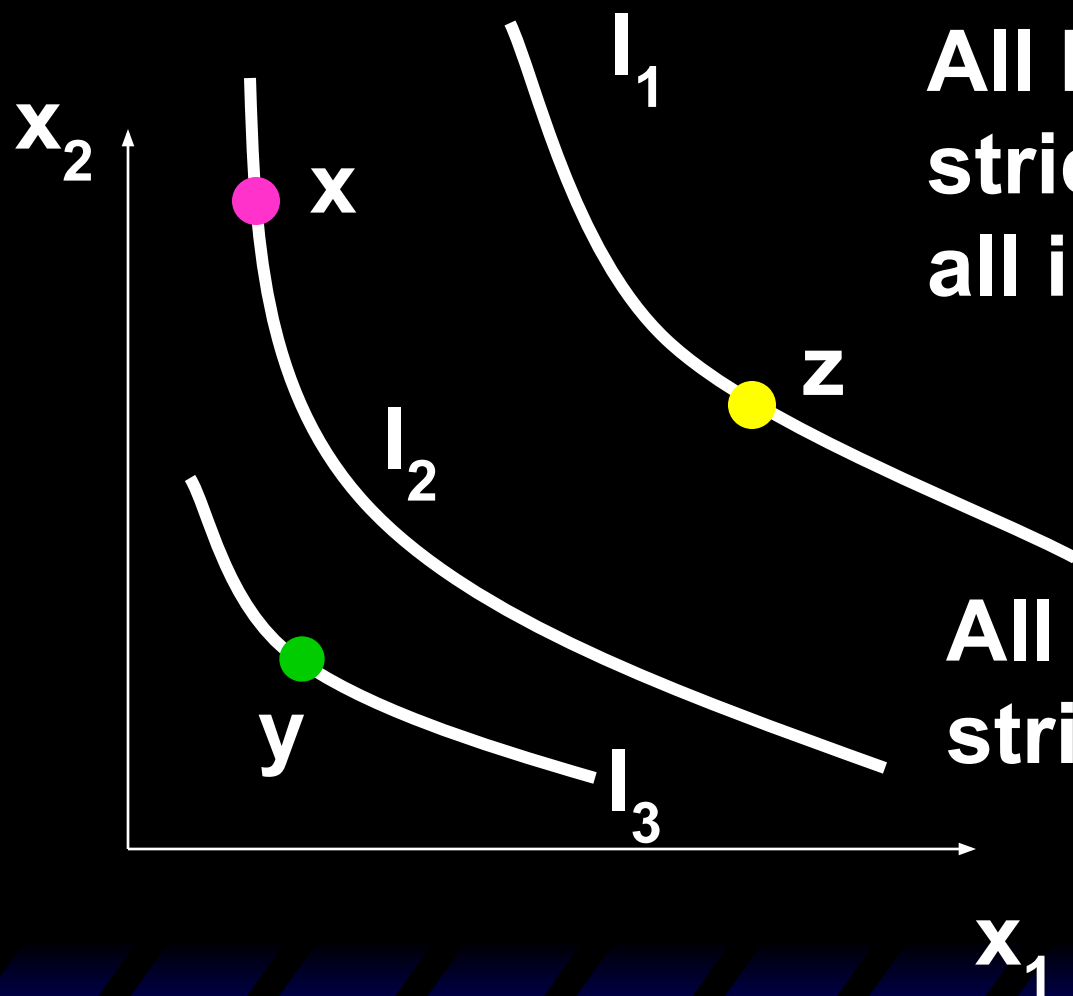
Indifference Curves



Indifference Curves



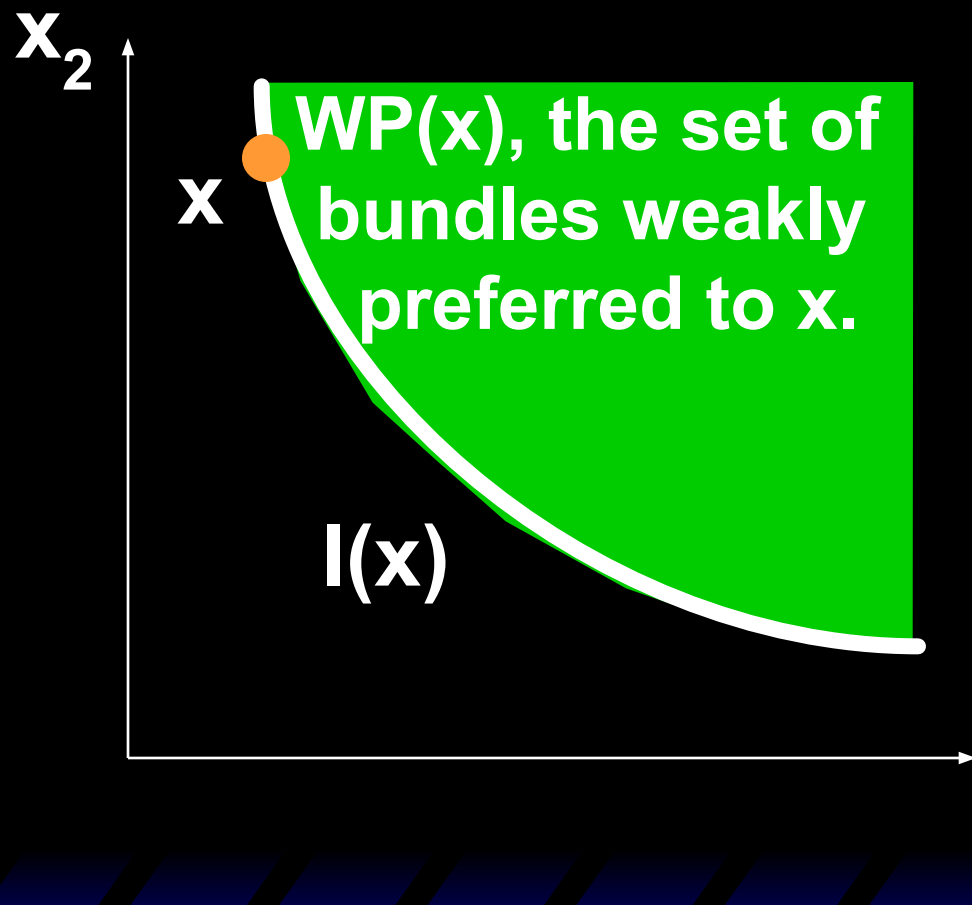
Indifference Curves



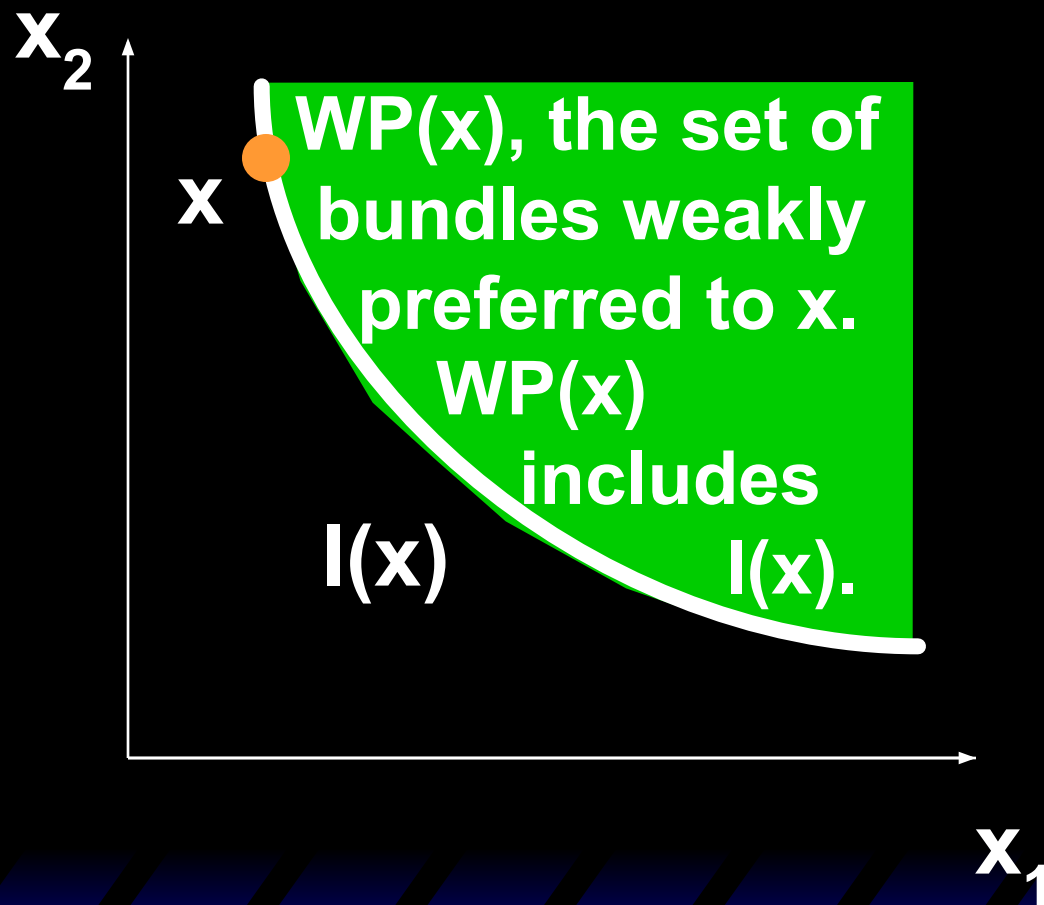
All bundles in I_1 are strictly preferred to all in I_2 .

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

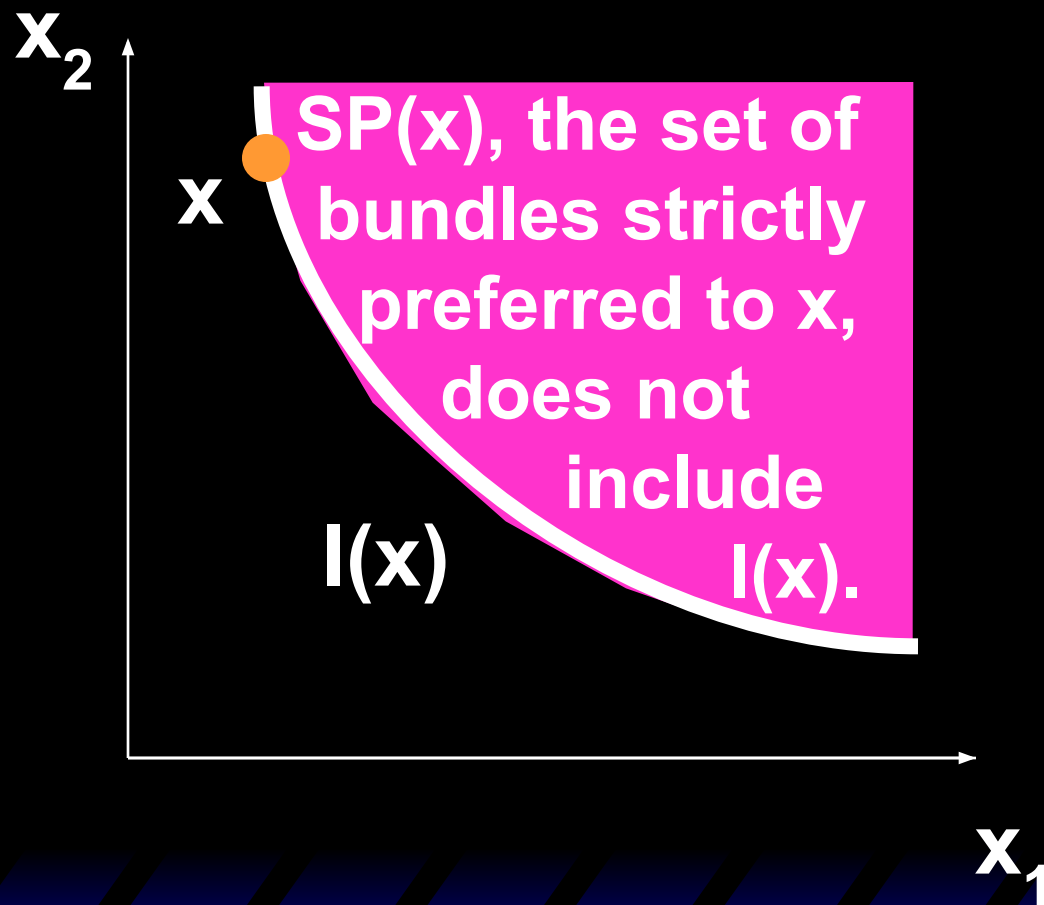
Indifference Curves



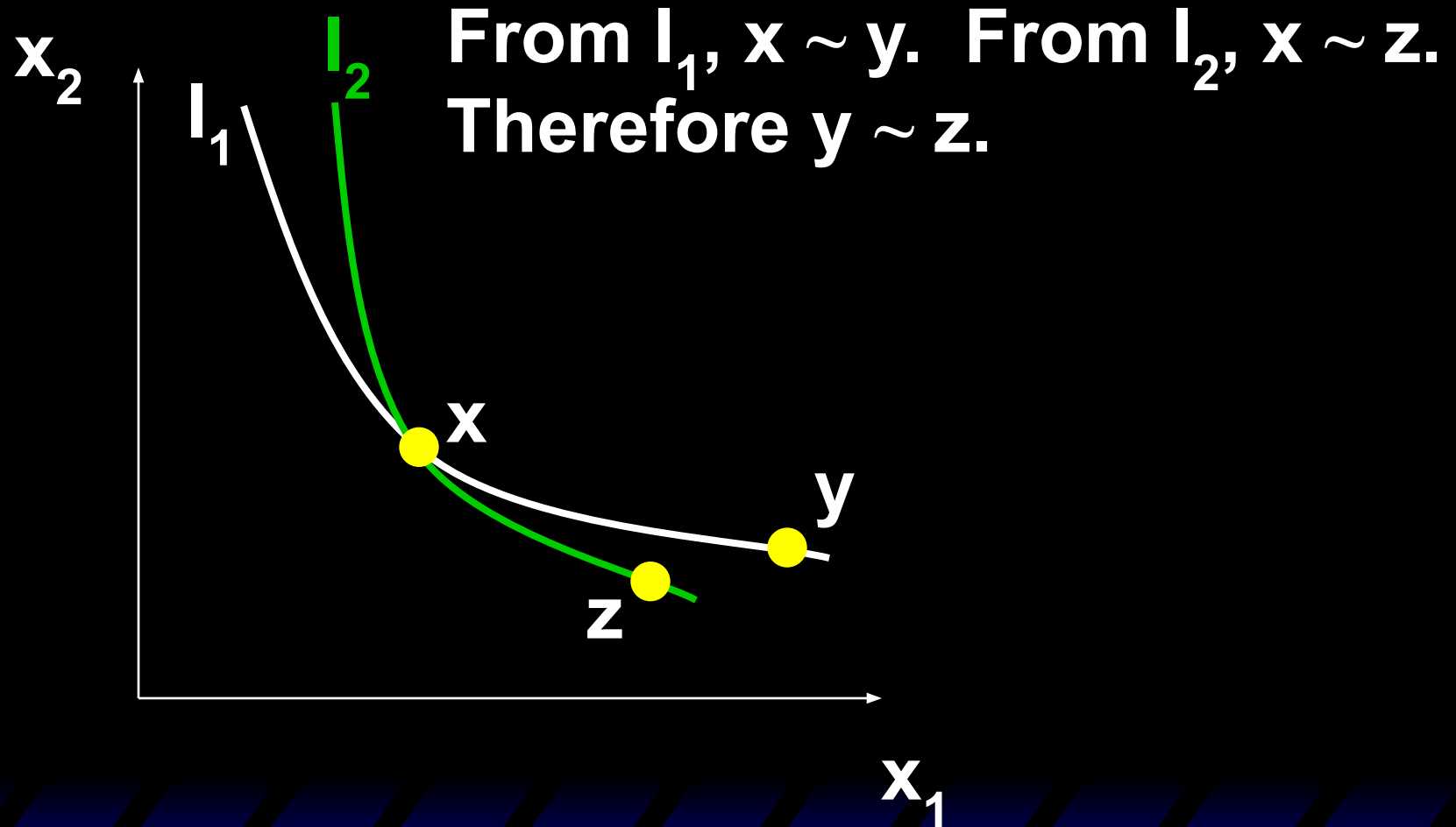
Indifference Curves



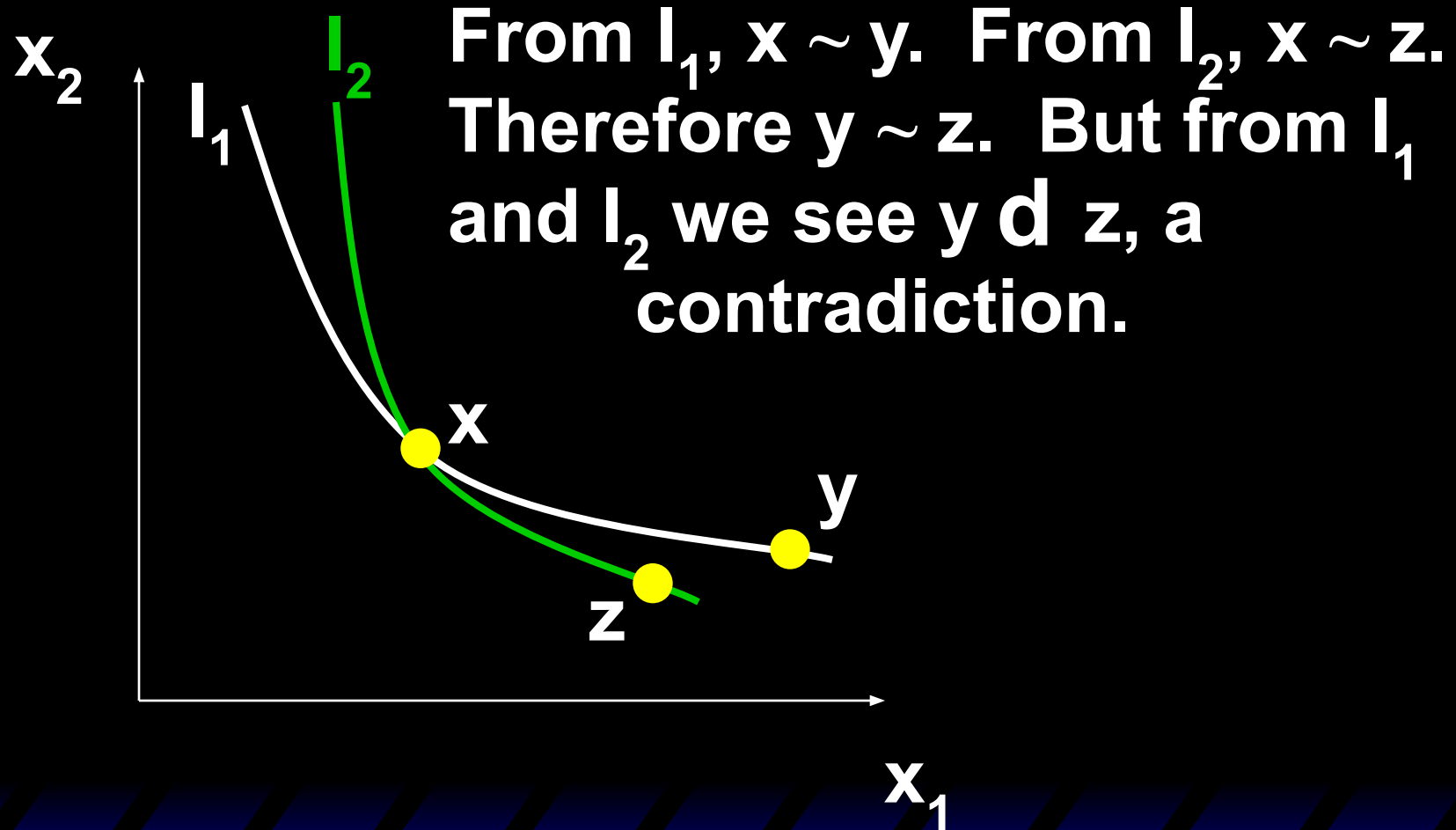
Indifference Curves



Indifference Curves Cannot Intersect



Indifference Curves Cannot Intersect

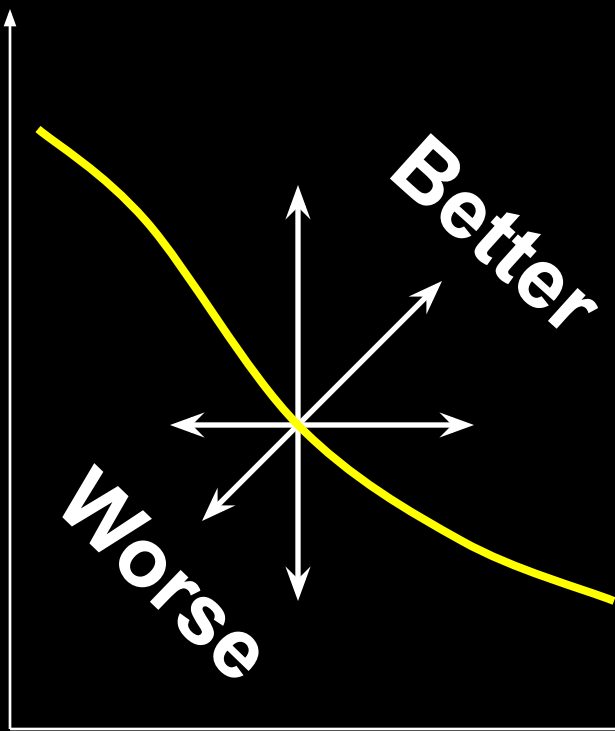


Slopes of Indifference Curves

- 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

Good 2



**Two goods →
a negatively sloped
indifference curve.**

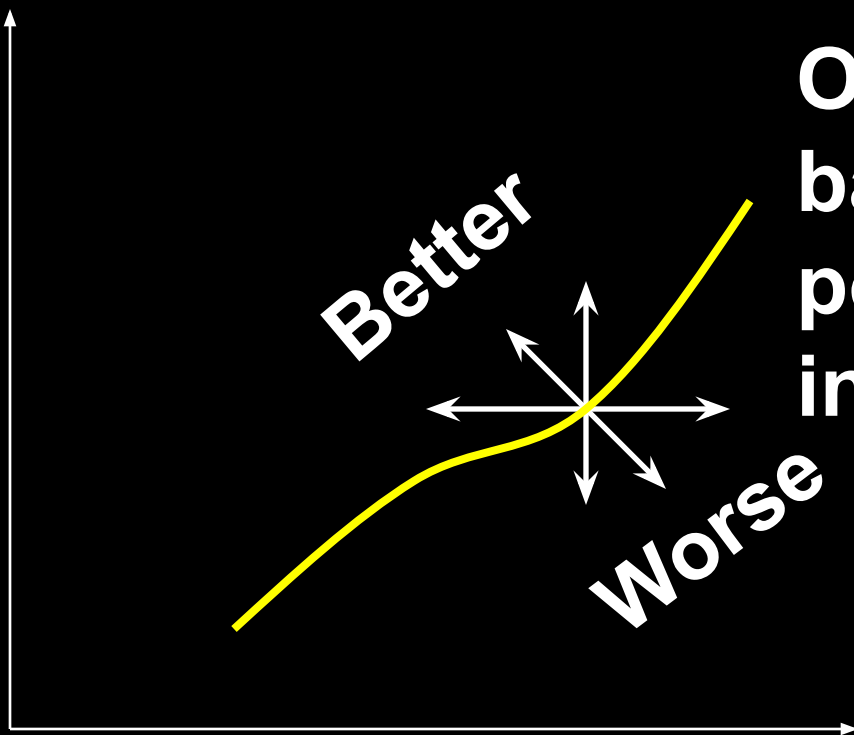
Good 1

Slopes of Indifference Curves

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

Slopes of Indifference Curves

Good 2



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

Bad 1

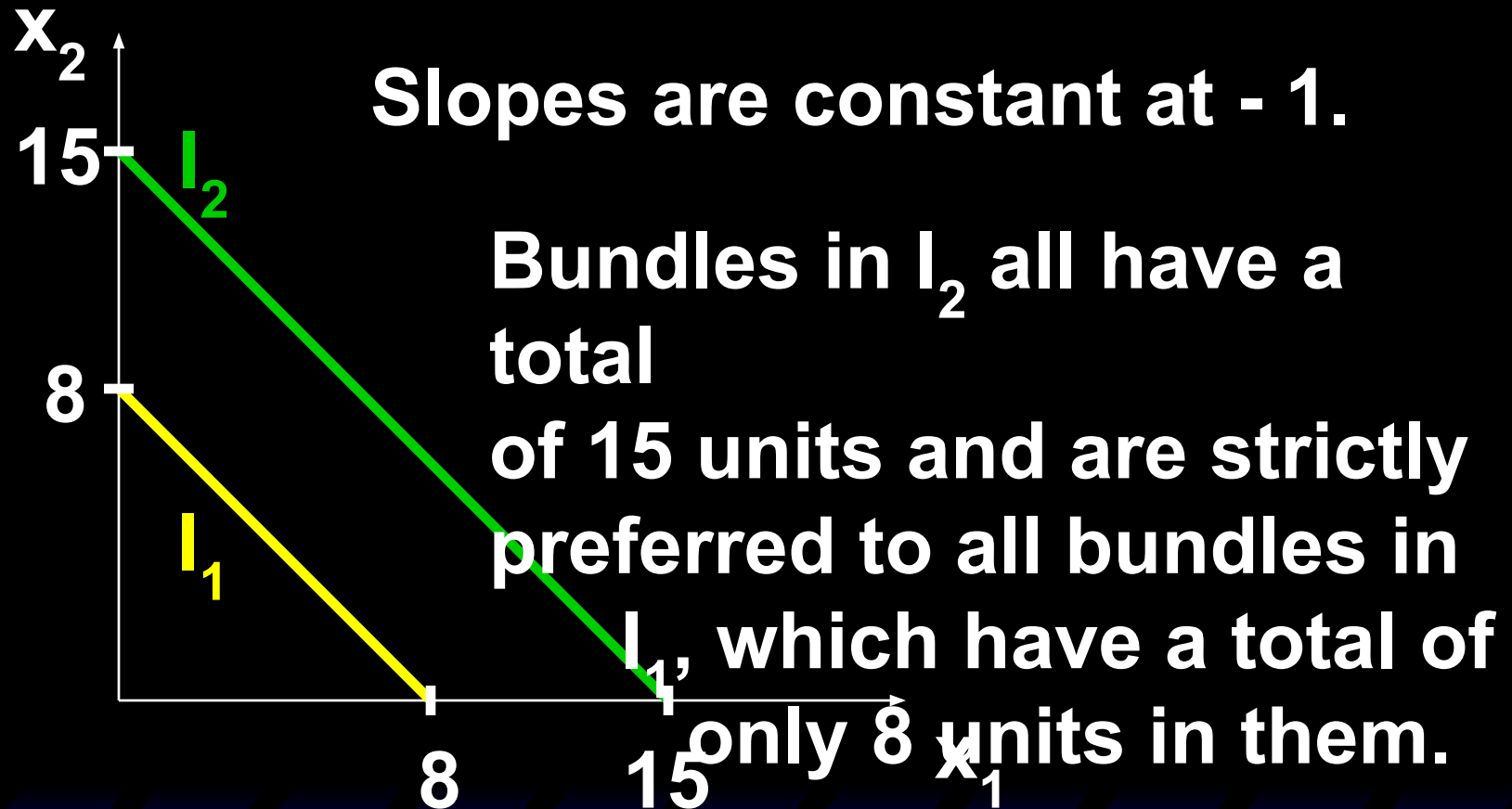
Slopes of Indifference Curves

- If the consumer doesn't care about a good then this good is a **neutral** good.

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.

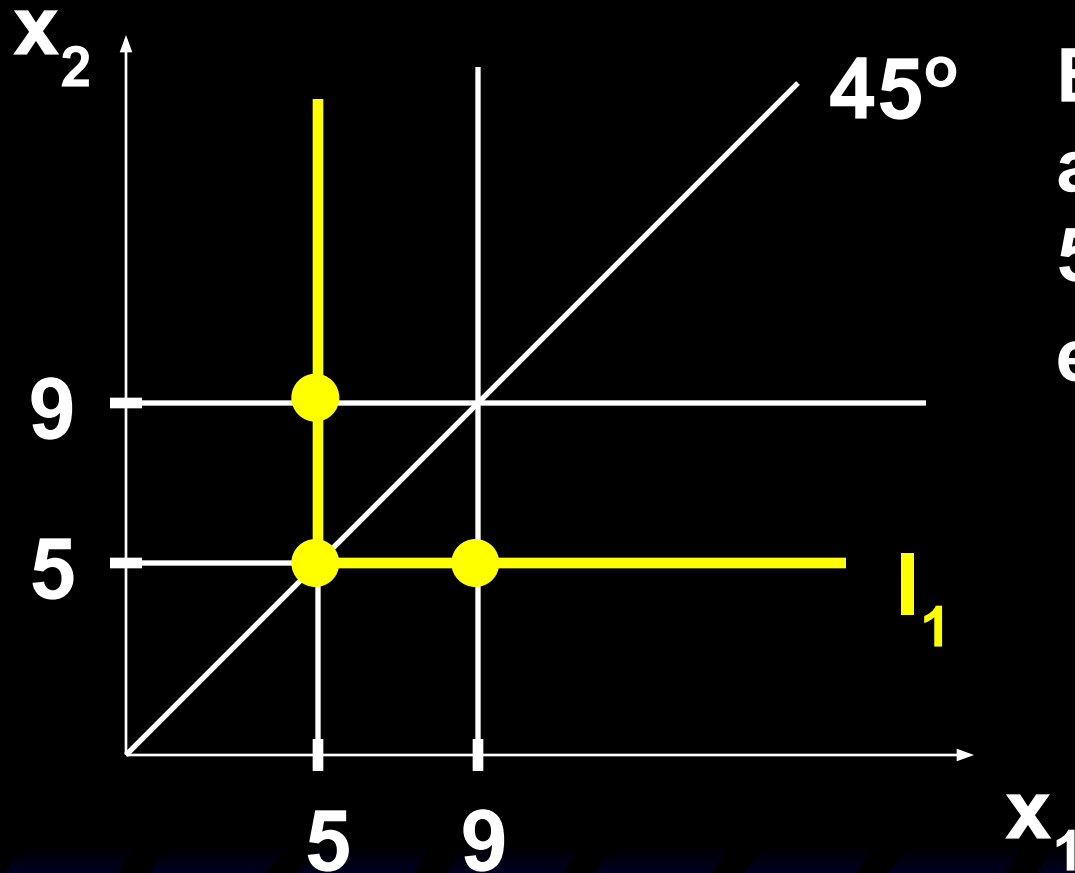
Extreme Cases of Indifference Curves; Perfect Substitutes



Extreme Cases of Indifference Curves; Perfect Complements

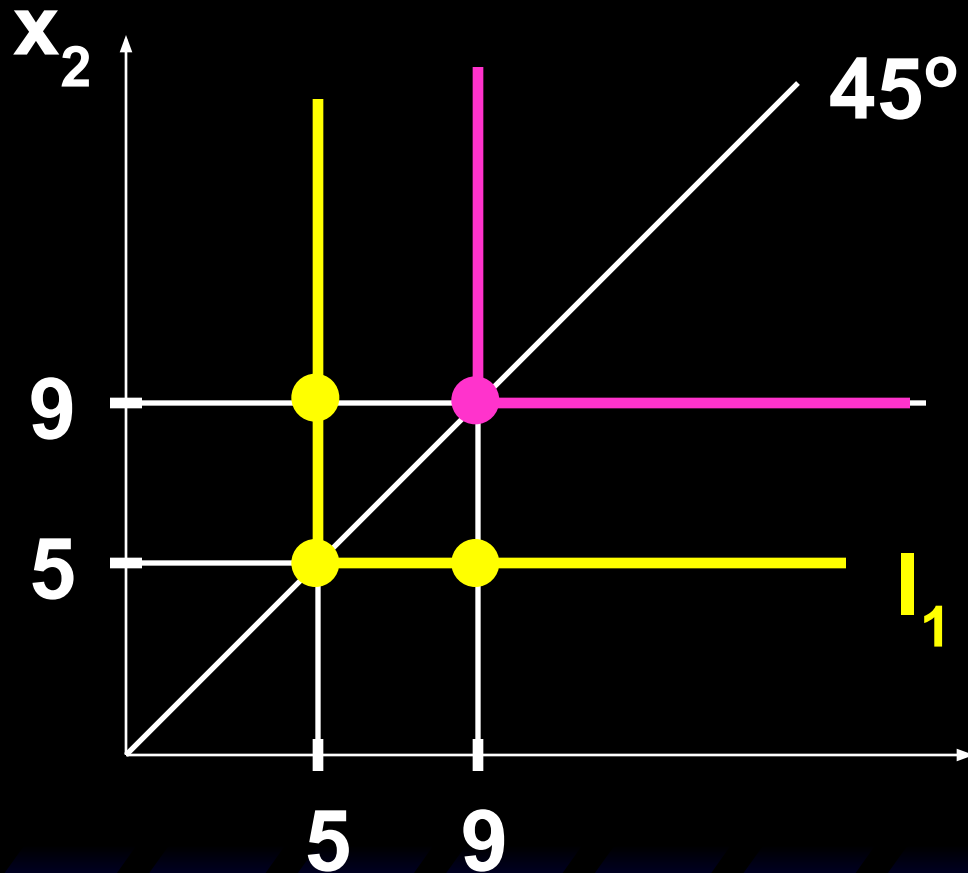
- If a consumer always consumes commodities 1 and 2 in fixed proportion (e.g. one-to-one), then the commodities are **perfect complements** and only the **number of pairs** of units of the two commodities determines the preference rank-order of bundles.

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

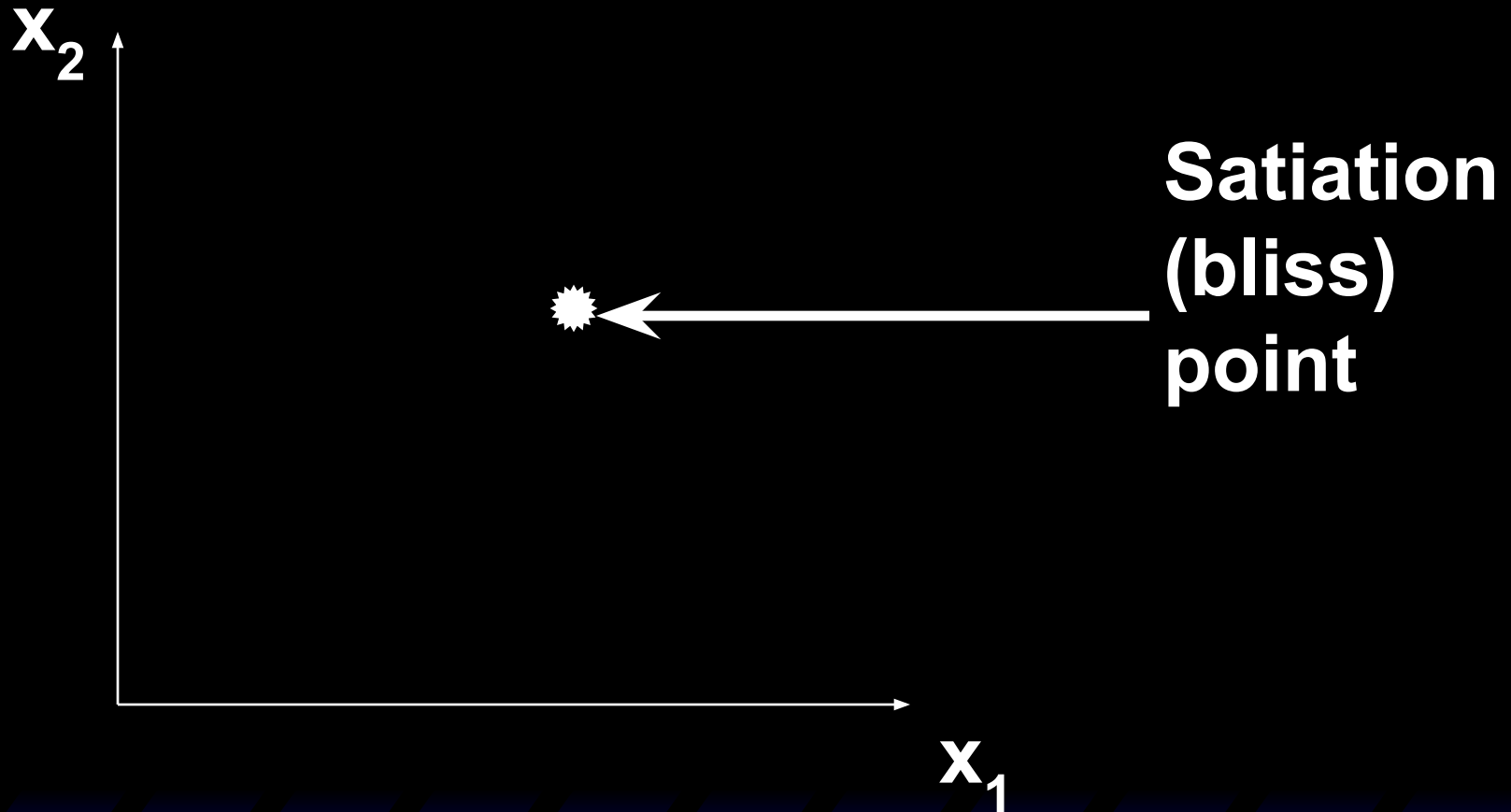


Since each of $(5, 5)$, $(5, 9)$ and $(9, 5)$ contains 5 pairs, each is less preferred than the bundle $(9, 9)$ which contains 9 pairs.

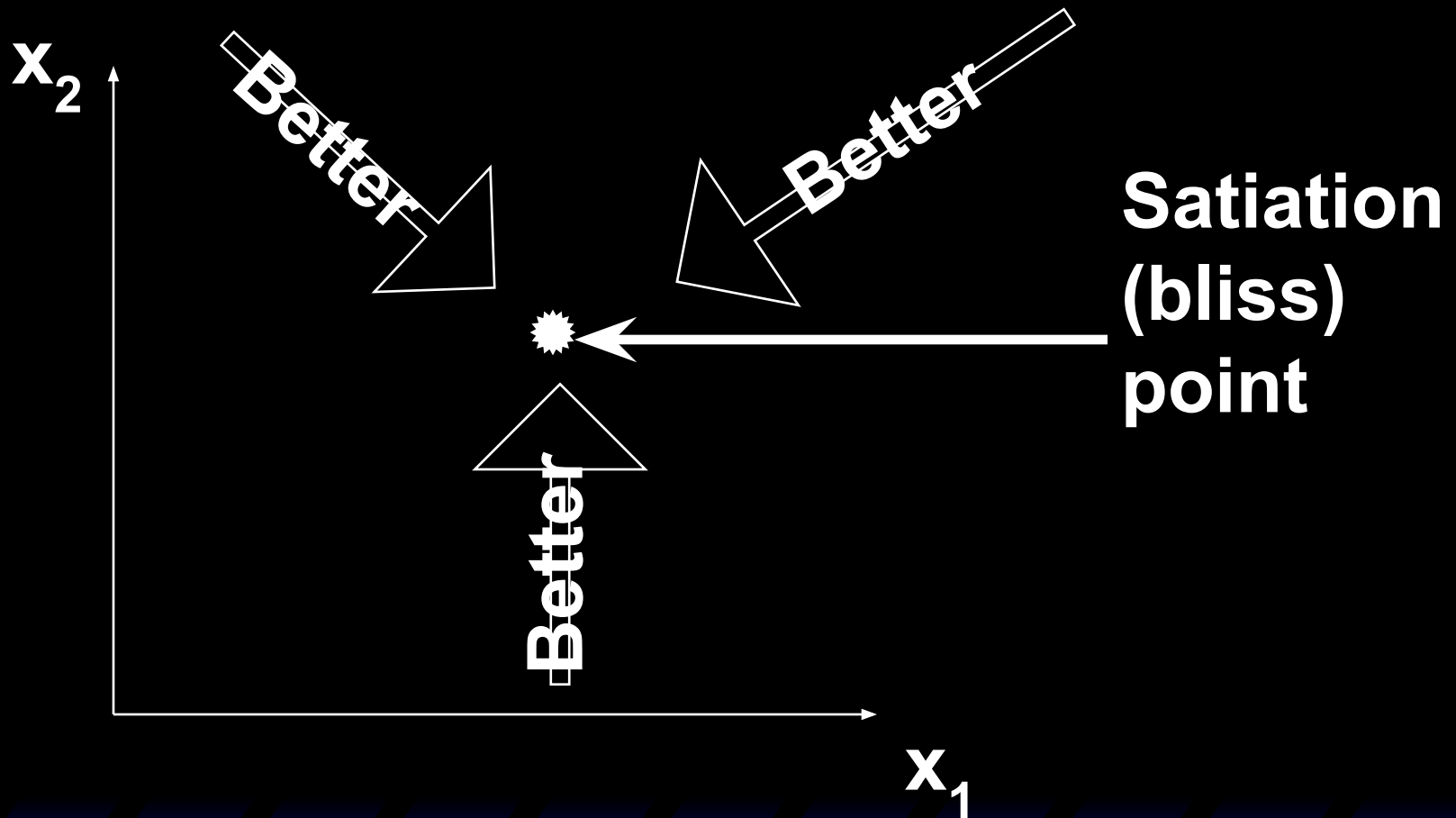
Preferences Exhibiting Satiation

- 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?

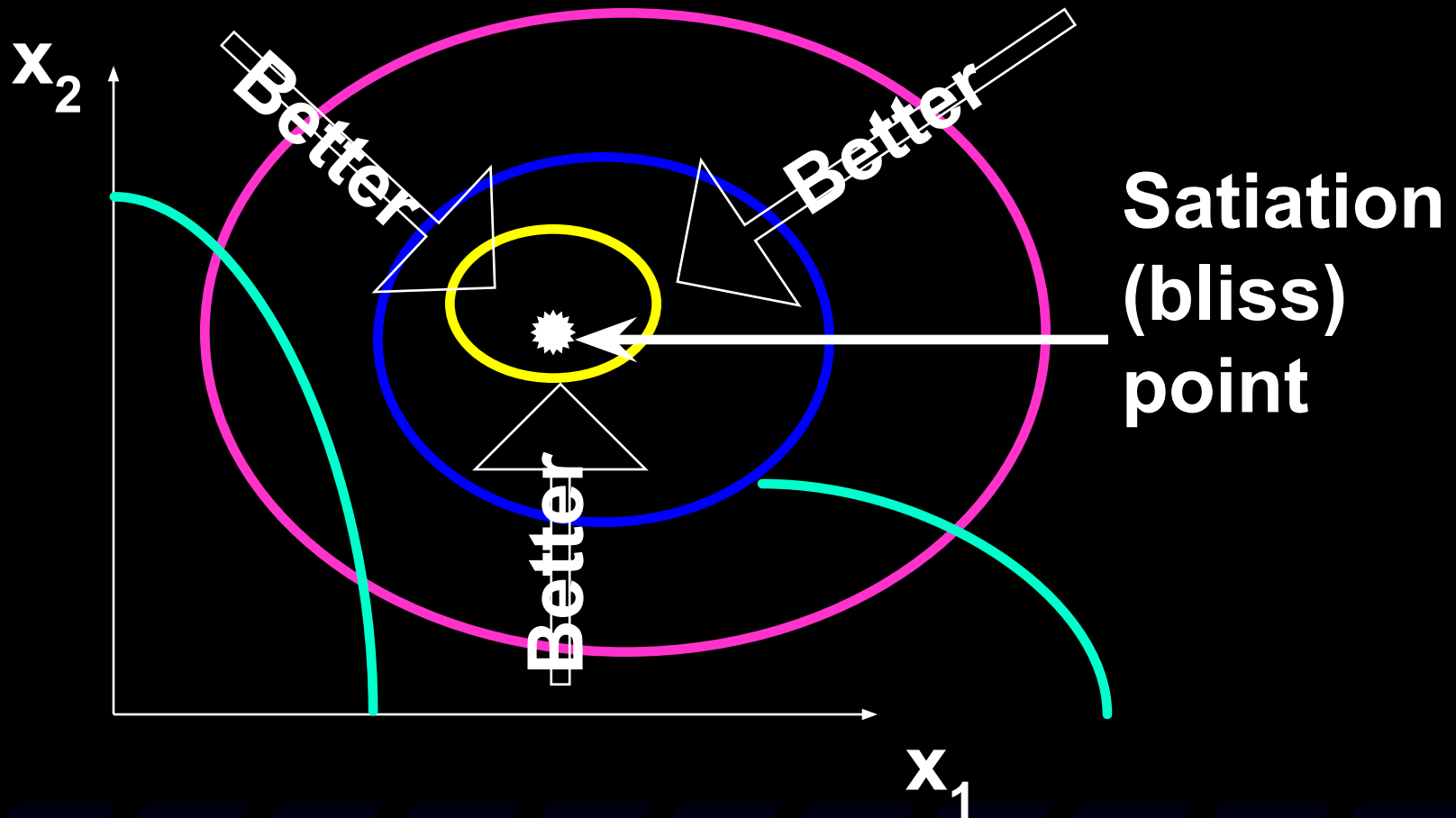
Indifference Curves Exhibiting Satiation



Indifference Curves Exhibiting Satiation



Indifference Curves Exhibiting Satiation



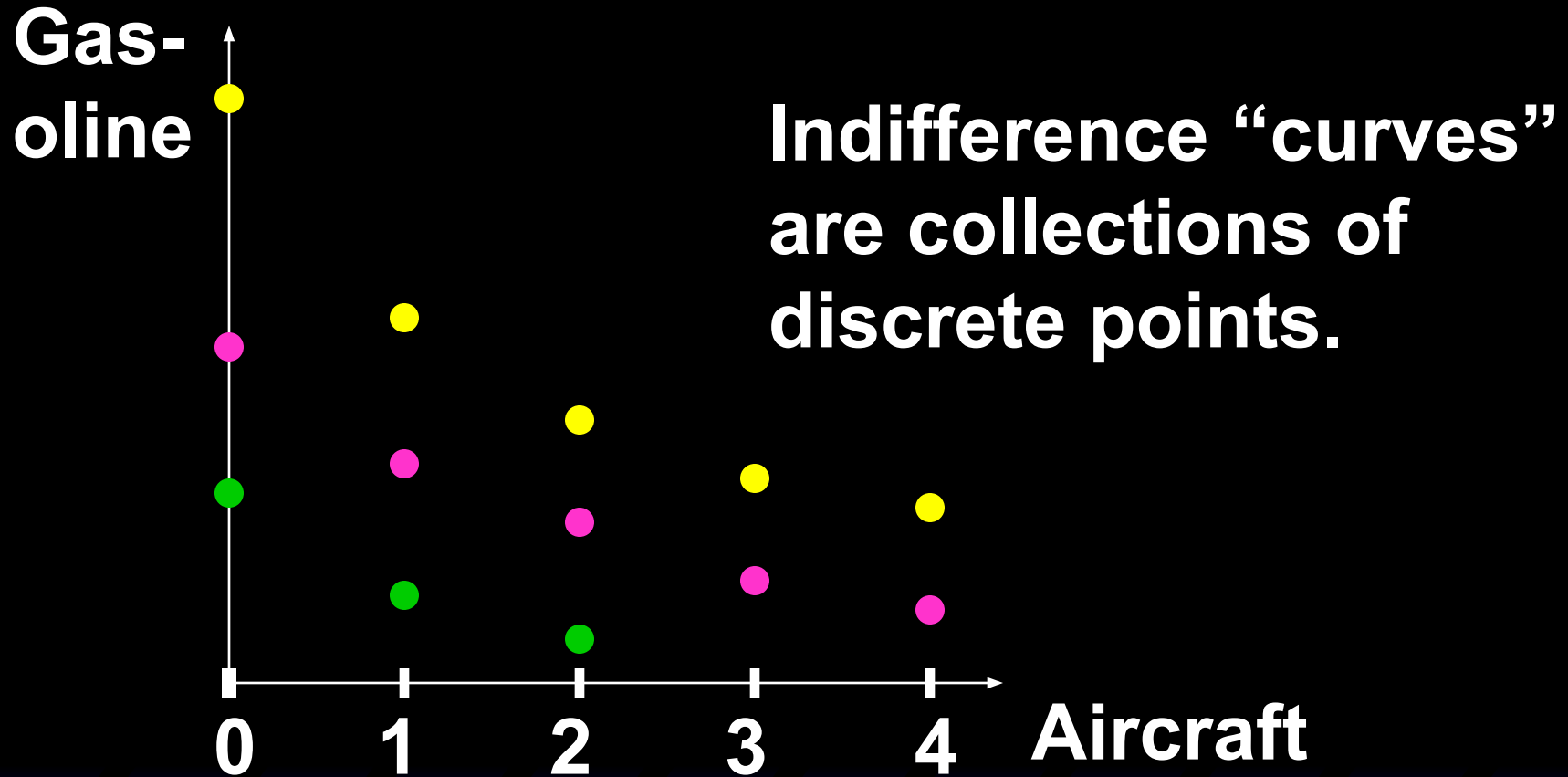
Indifference Curves for Discrete Commodities

- 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, eggs.

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



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

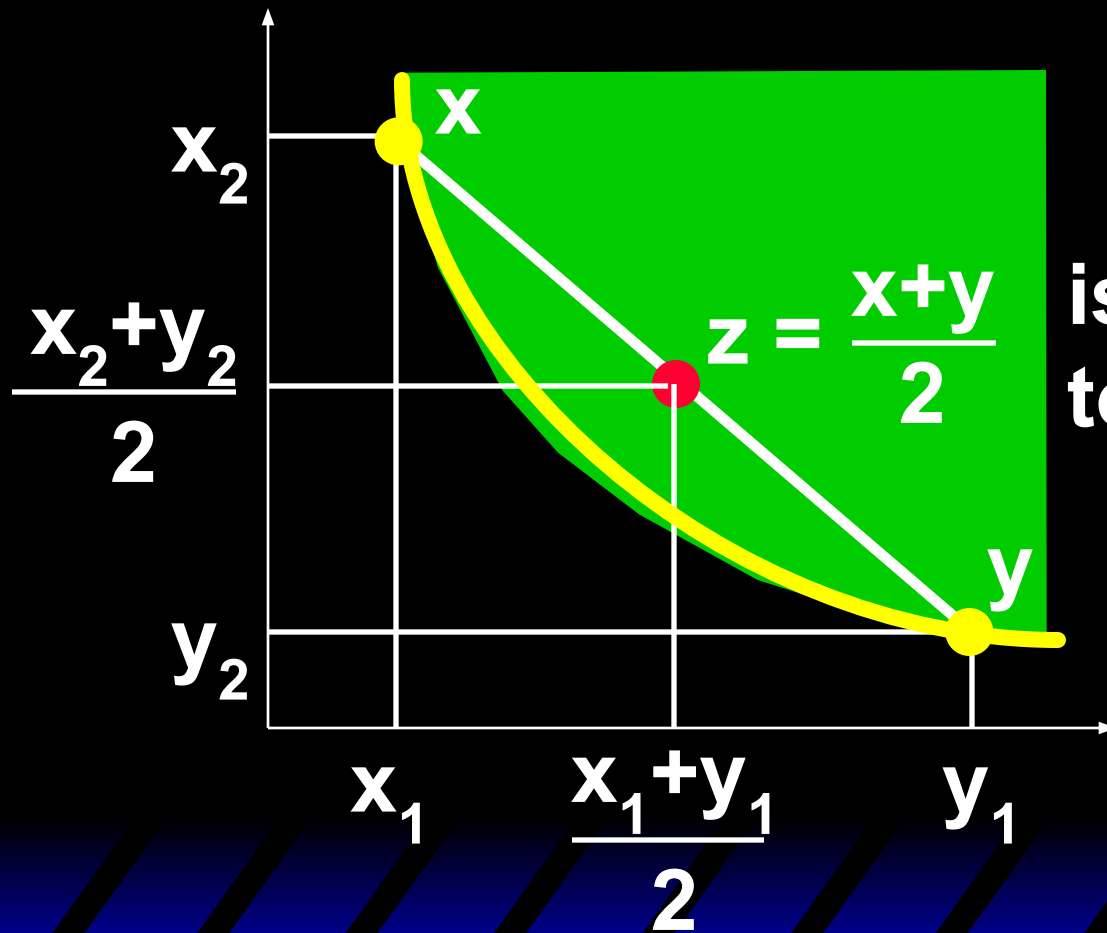
- **Convexity**: Mixtures of bundles are (at least weakly) preferred to the bundles themselves. E.g., the 50-50 mixture of the bundles x and y is
$$z = (0.5)x + (0.5)y.$$
 z is at least as preferred as x or y .

Well-Behaved Preferences

- **Convexity**

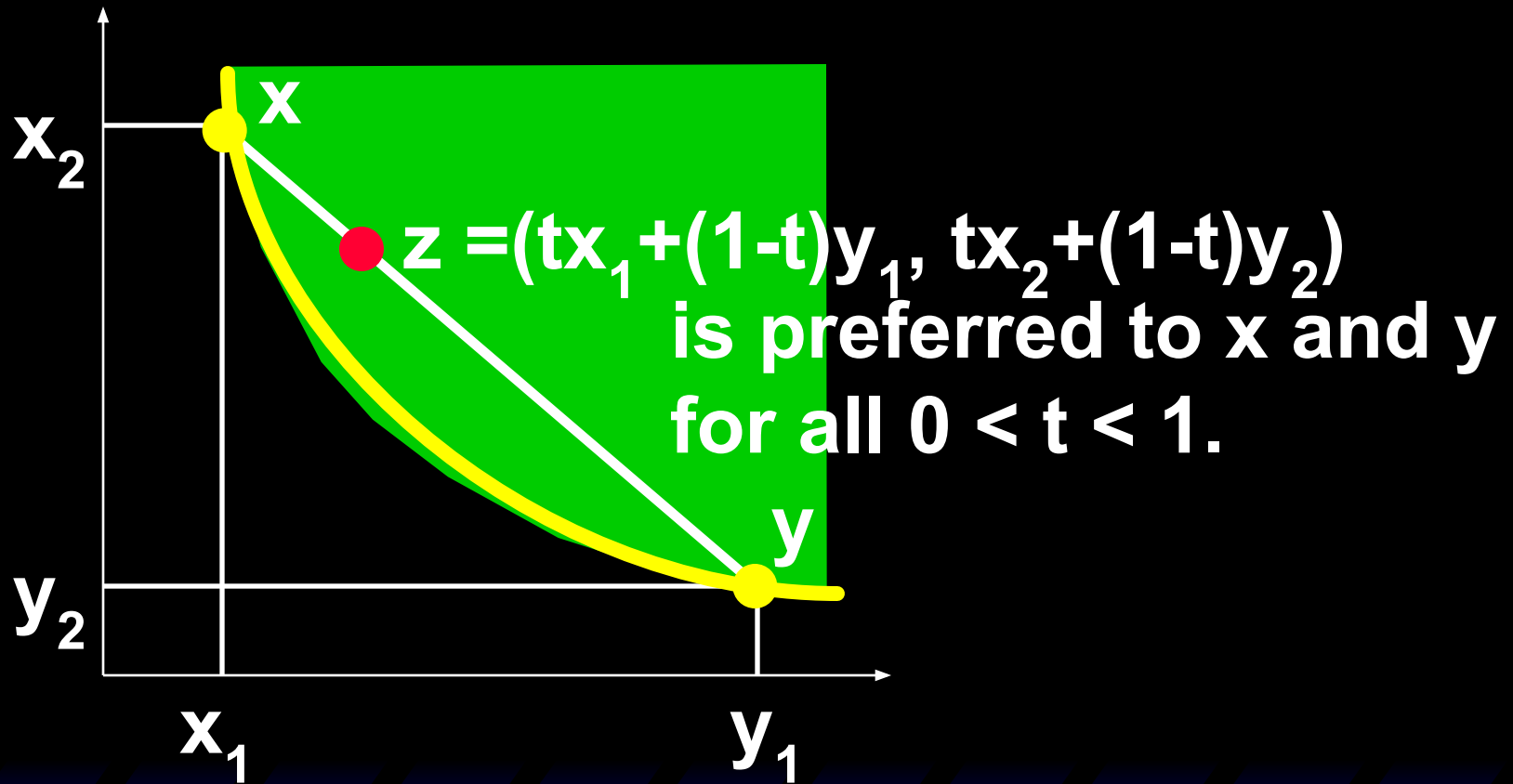
Are preferences for the sex of kids convex? I.e. will society prefer to have kids of the same sex, or different sex?

Well-Behaved Preferences -- Convexity.



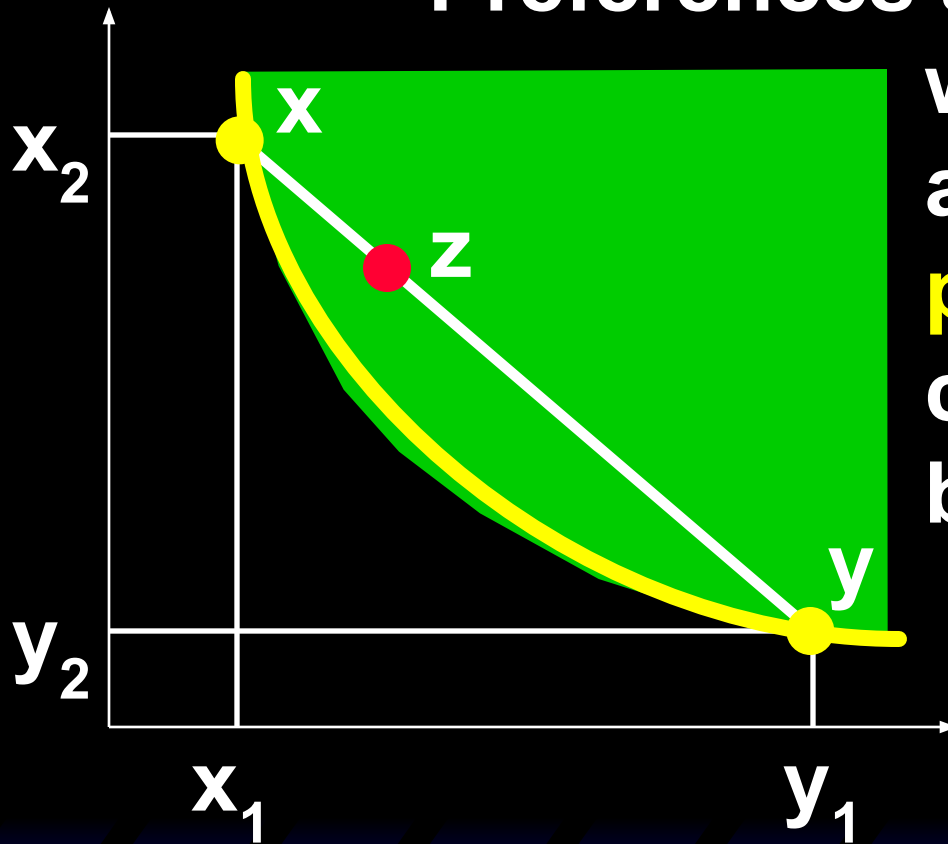
is strictly preferred
to both x and y .

Well-Behaved Preferences -- Convexity.

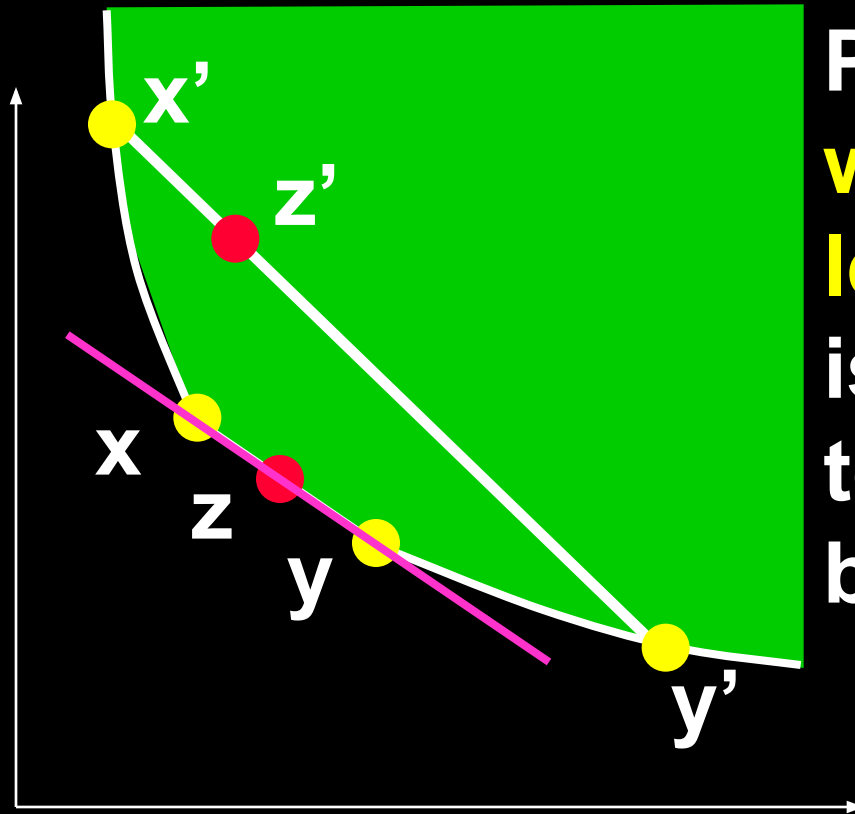


Well-Behaved Preferences -- Convexity.

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

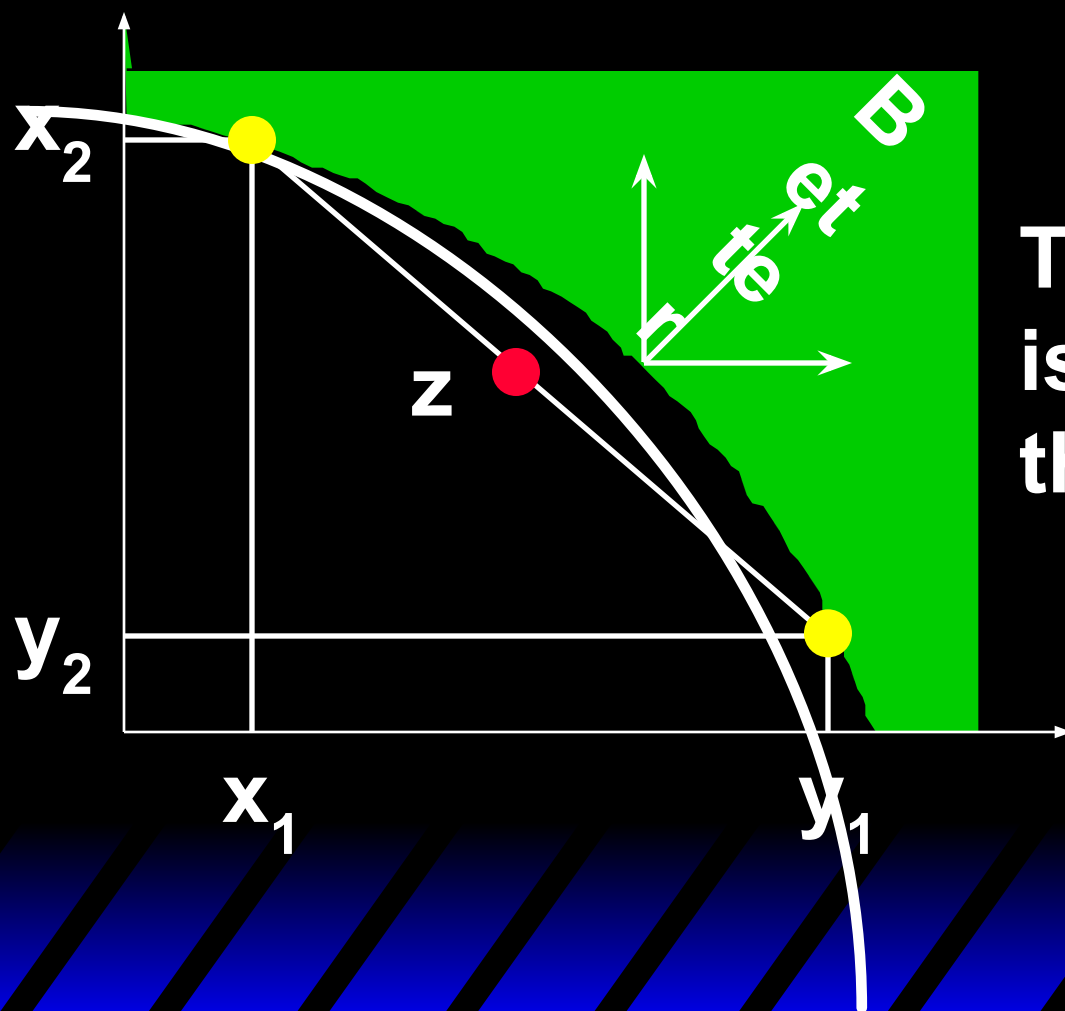


Well-Behaved Preferences -- Weak Convexity.



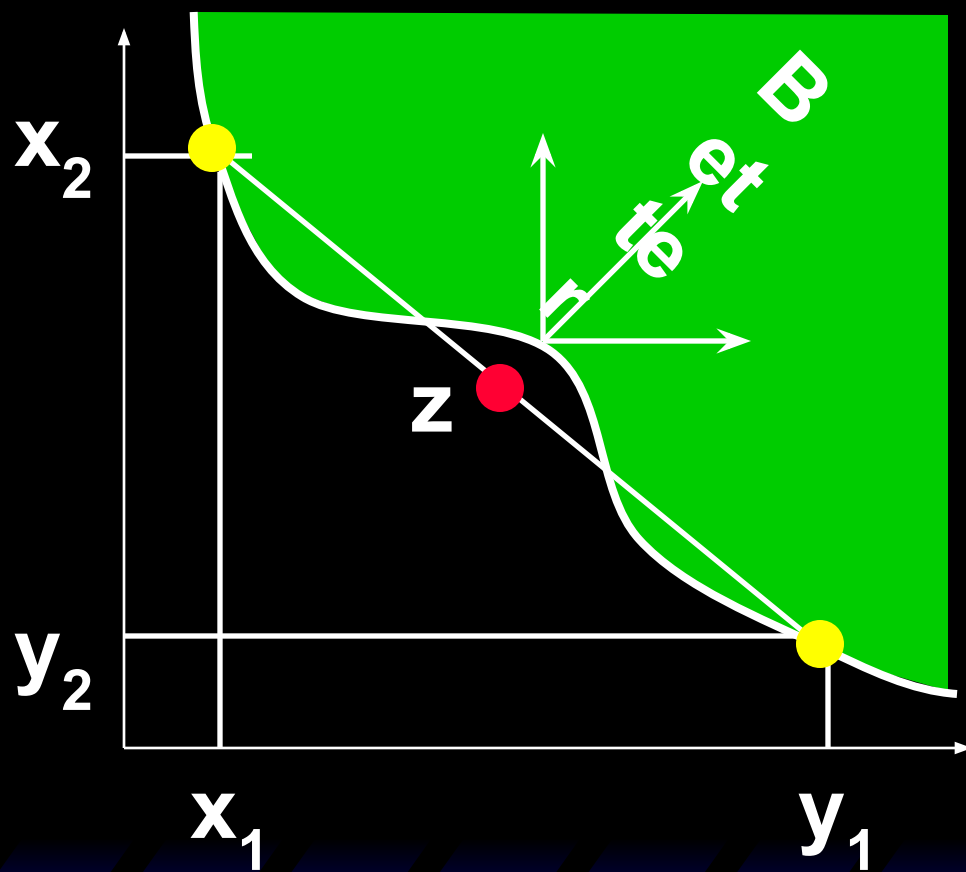
Preferences are **weakly convex** if **at least one** mixture z is **equally preferred** to a component bundle.

Non-Convex Preferences



The mixture z is less preferred than x or y .

More Non-Convex Preferences

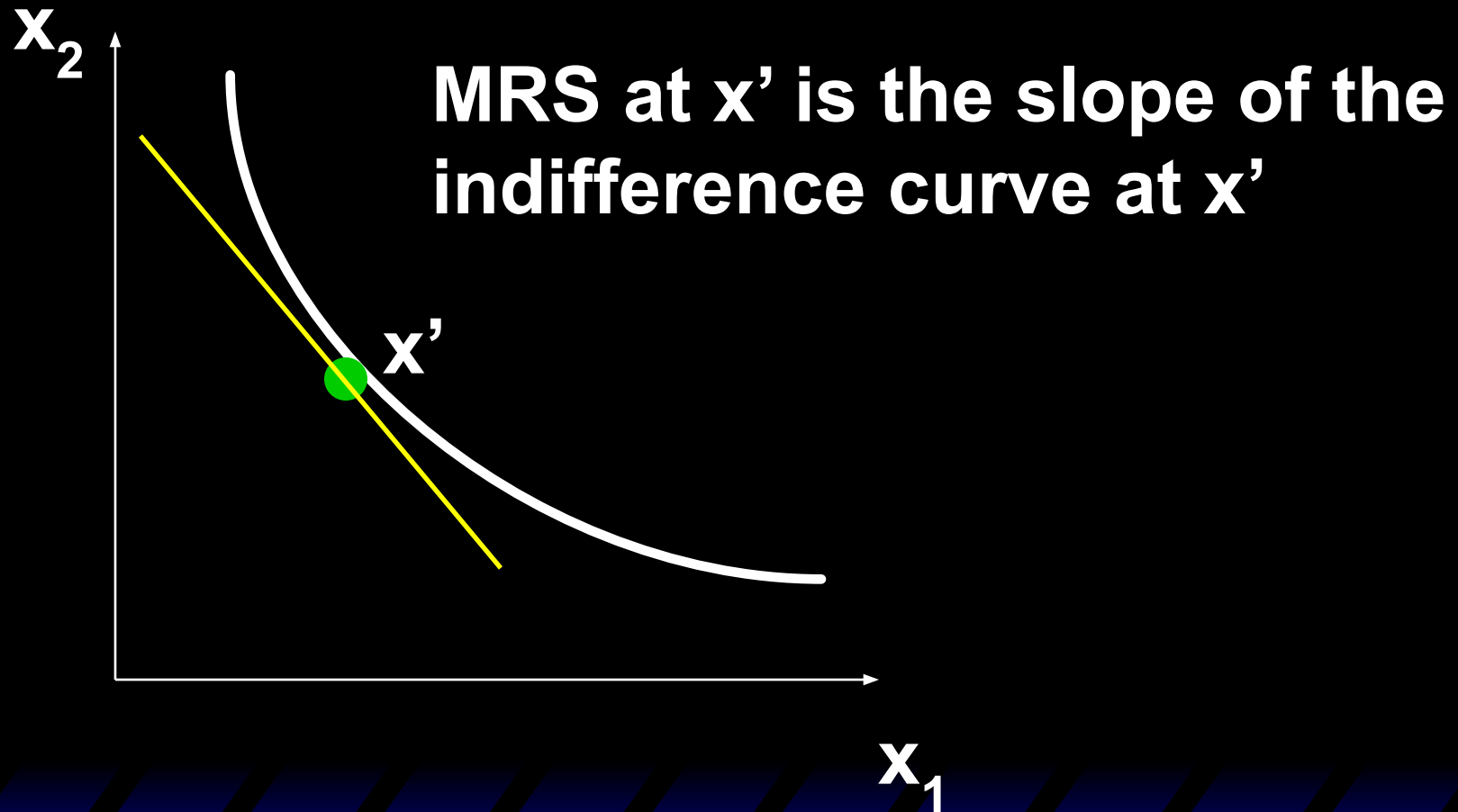


The mixture z is less preferred than x or y .

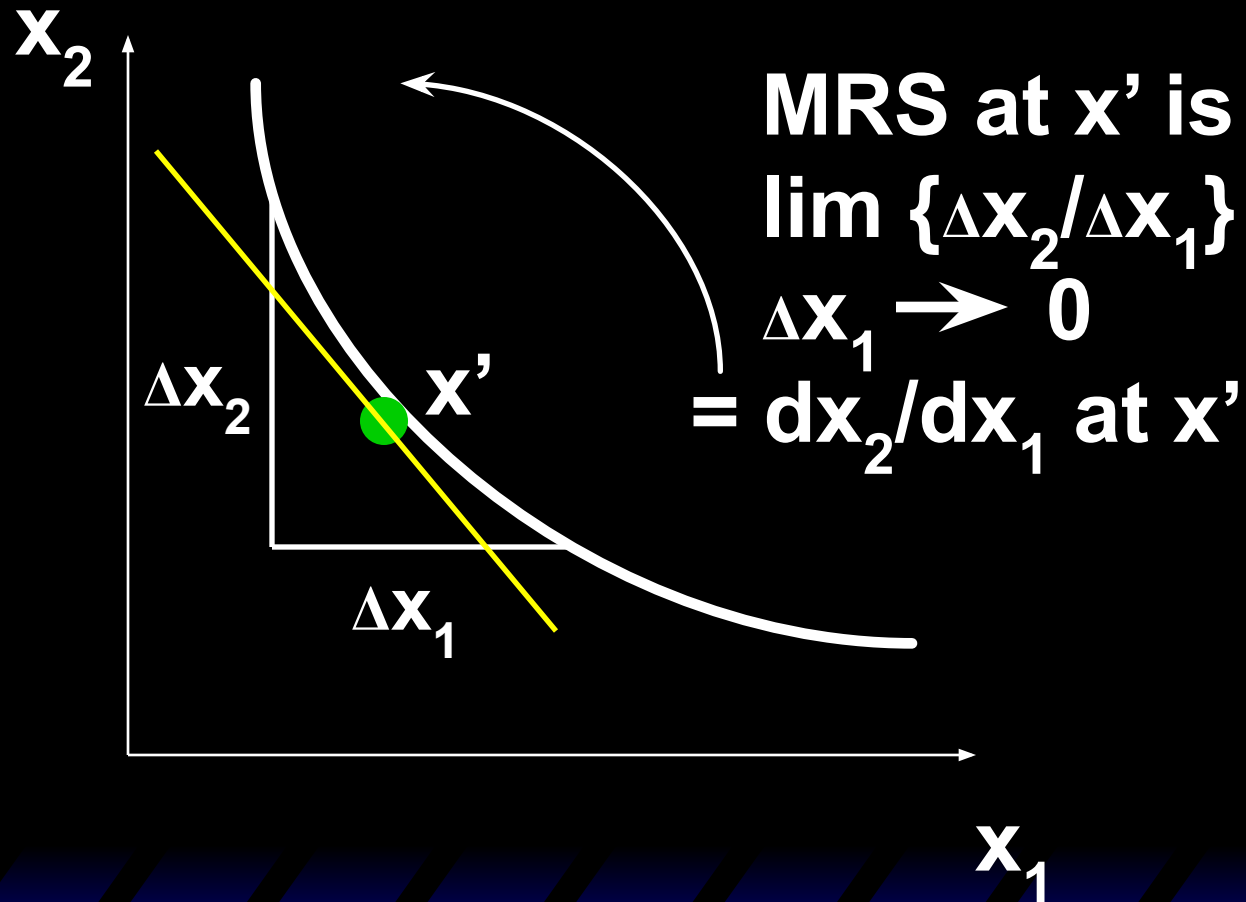
Slopes of Indifference Curves

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

Marginal Rate of Substitution

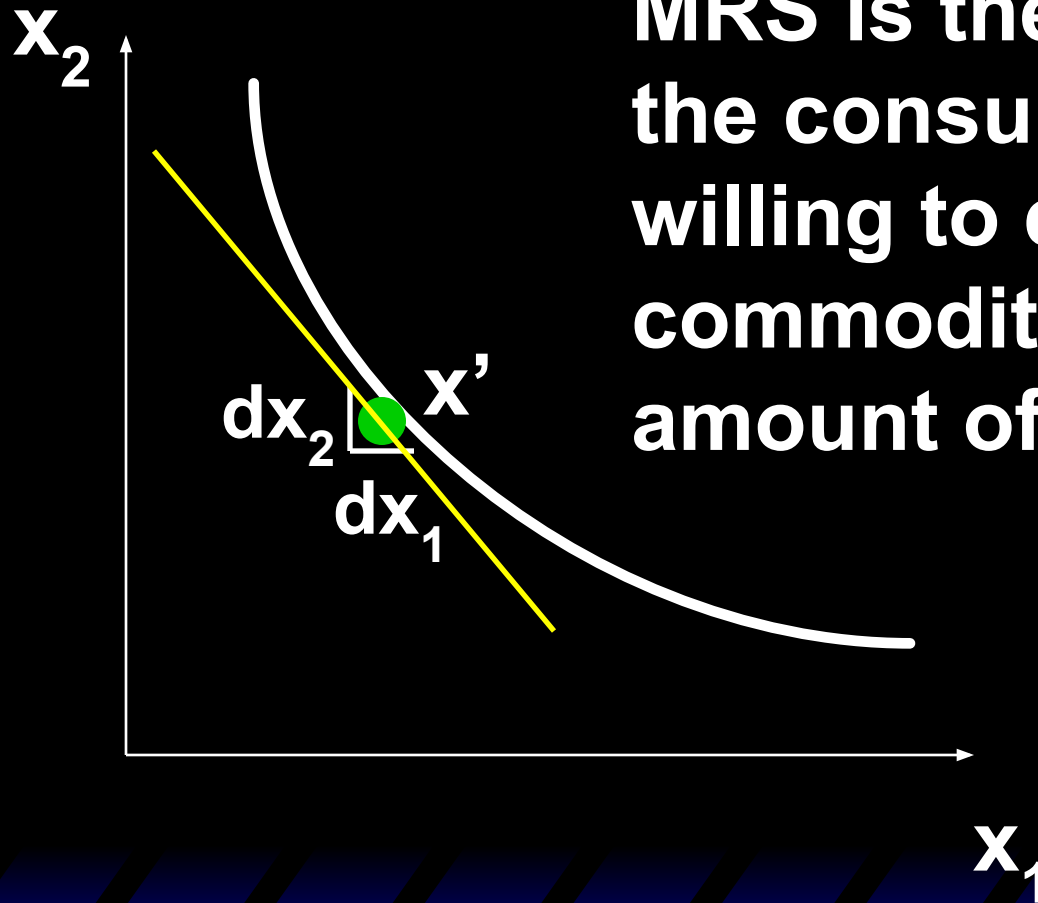


Marginal Rate of Substitution



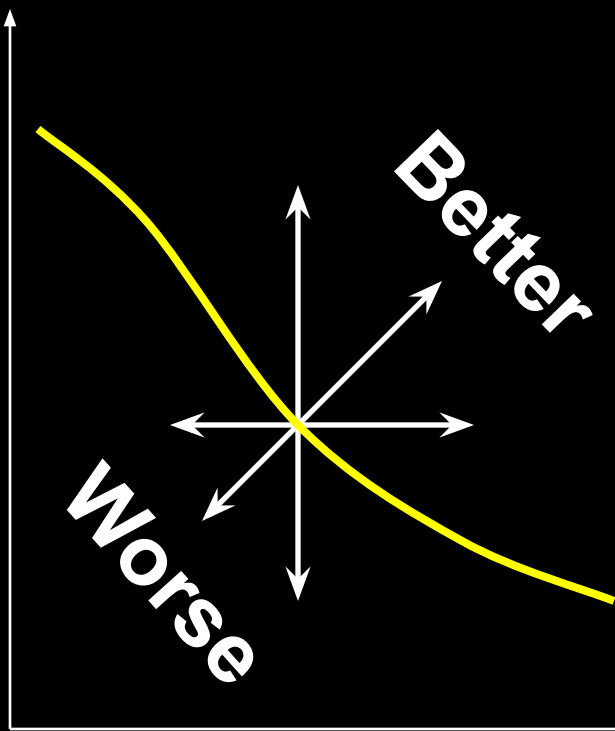
Marginal Rate of Substitution

$dx_2 = \text{MRS} \times dx_1$ 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

Good 2



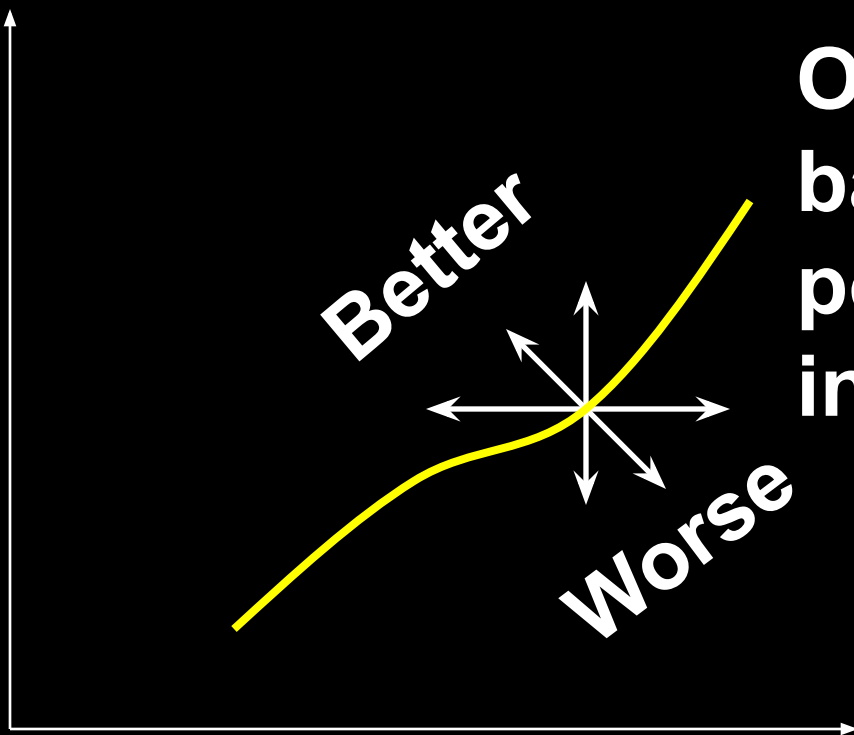
Two goods →
a negatively sloped
indifference curve

→ $MRS < 0$.

Good 1

MRS & Ind. Curve Properties

Good 2



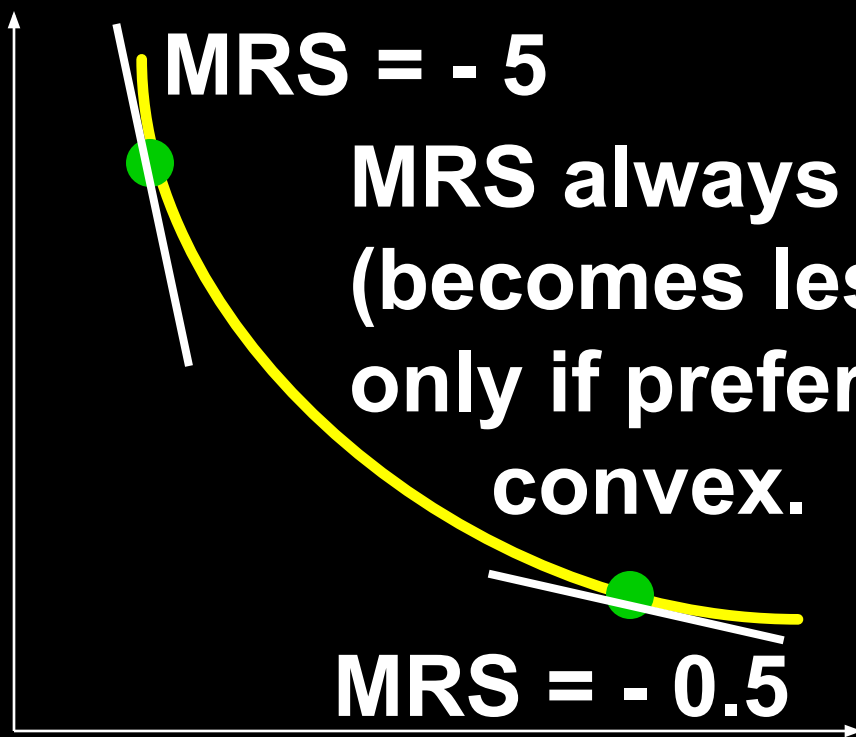
**One good and one
bad → a
positively sloped
indifference curve**

→ $MRS > 0$.

Bad 1

MRS & Ind. Curve Properties

Good 2



Good 1

MRS & Ind. Curve Properties

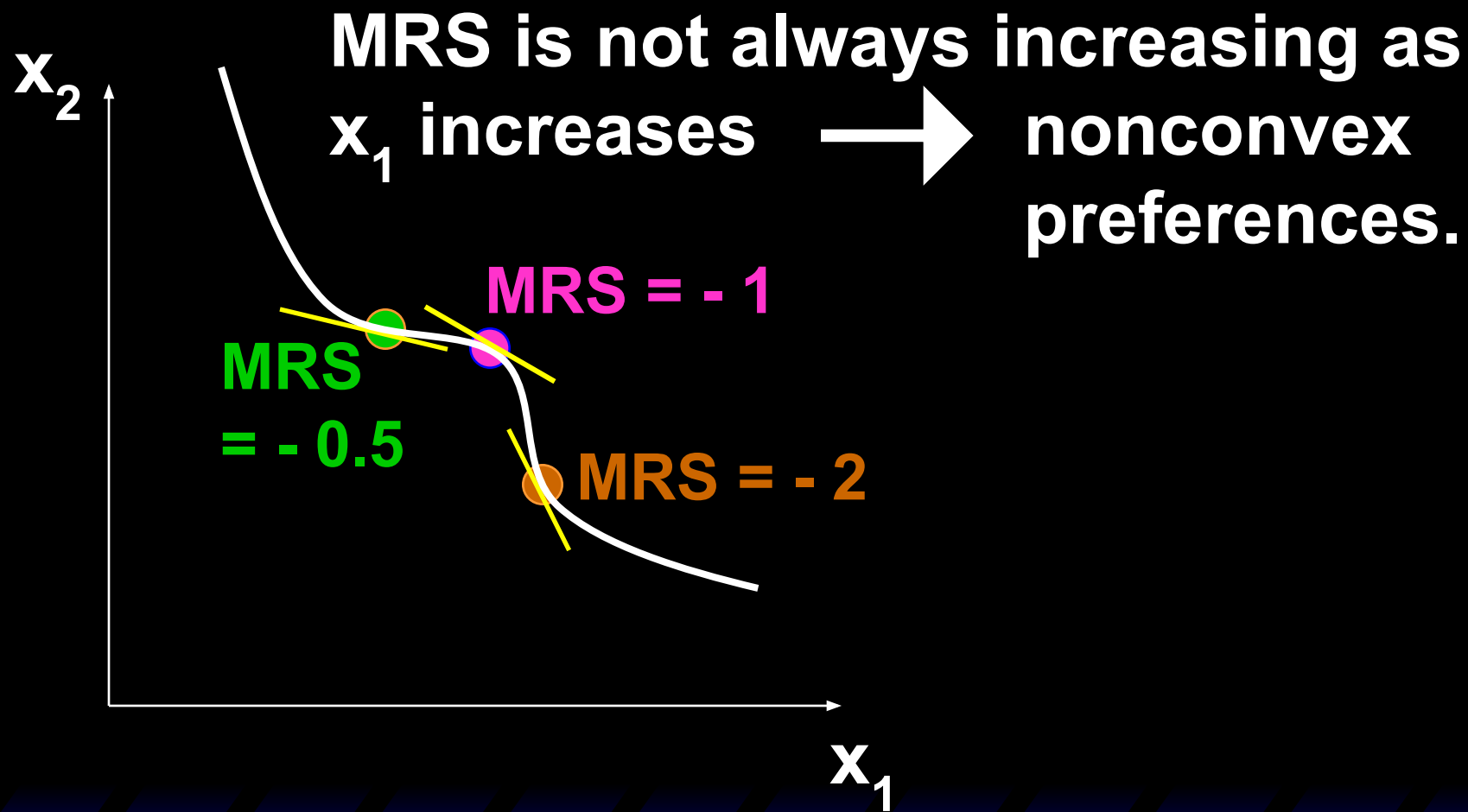
x_2 **MRS = - 0.5**

MRS decreases
(becomes more negative)
as x_1 increases \rightarrow
nonconvex preferences

MRS = - 5

x_1

MRS & Ind. Curve Properties



Marginal Rate of Substitution

- **MRS** is sometimes called *marginal willingness to pay*.

This happens when good x_2 represents „all other goods” and is measured in dollars.

Remember it is **marginal and** it is **willingness**