

INTERMEDIATE

8TH EDITION

MICROECONOMICS

HAL R. VARIAN

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 .
- ◆ \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 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 $x \succ y$.



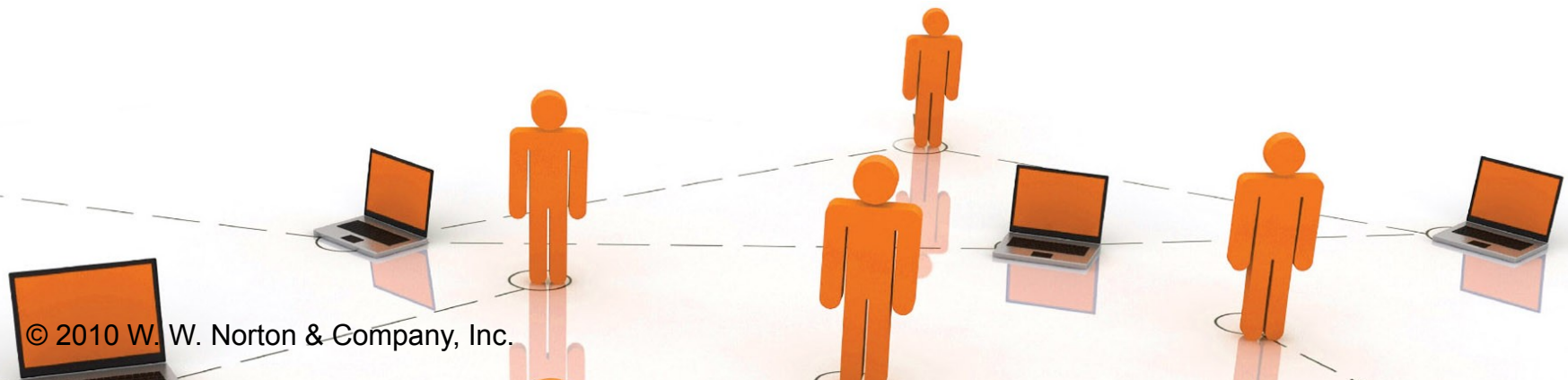
Assumptions about Preference Relations

- ◆ **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.*

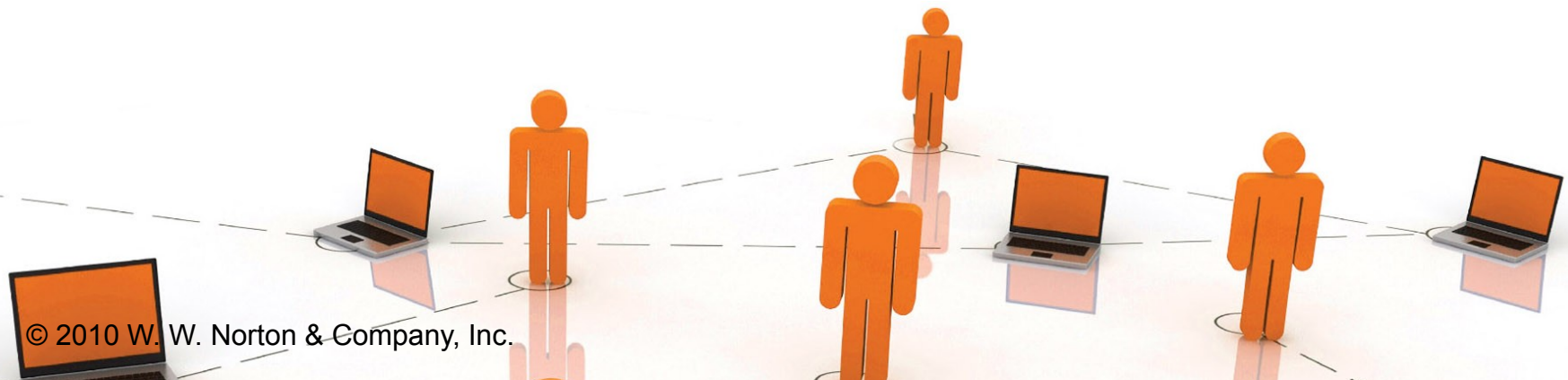
$$x \succsim x.$$



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.*

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

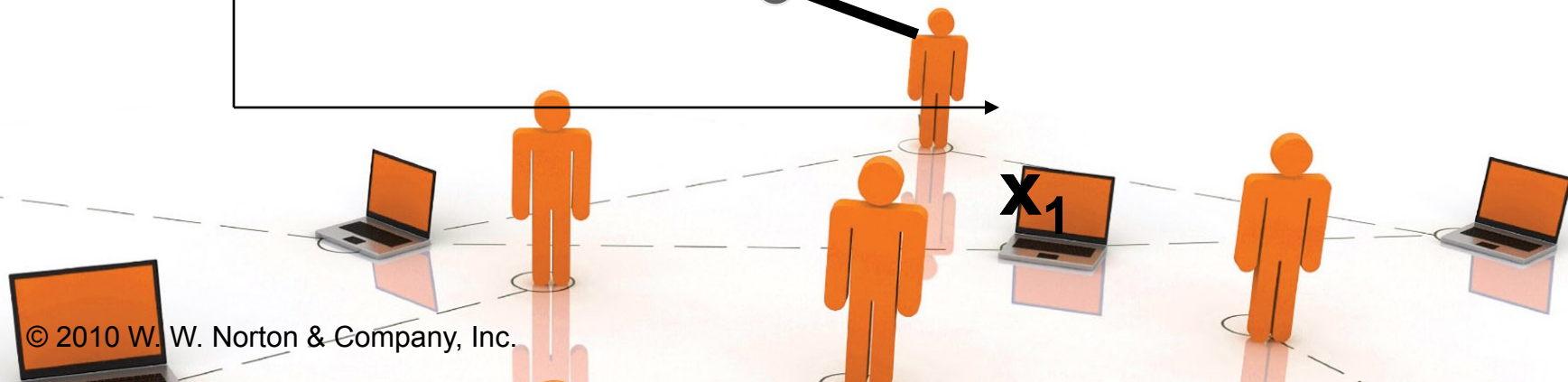
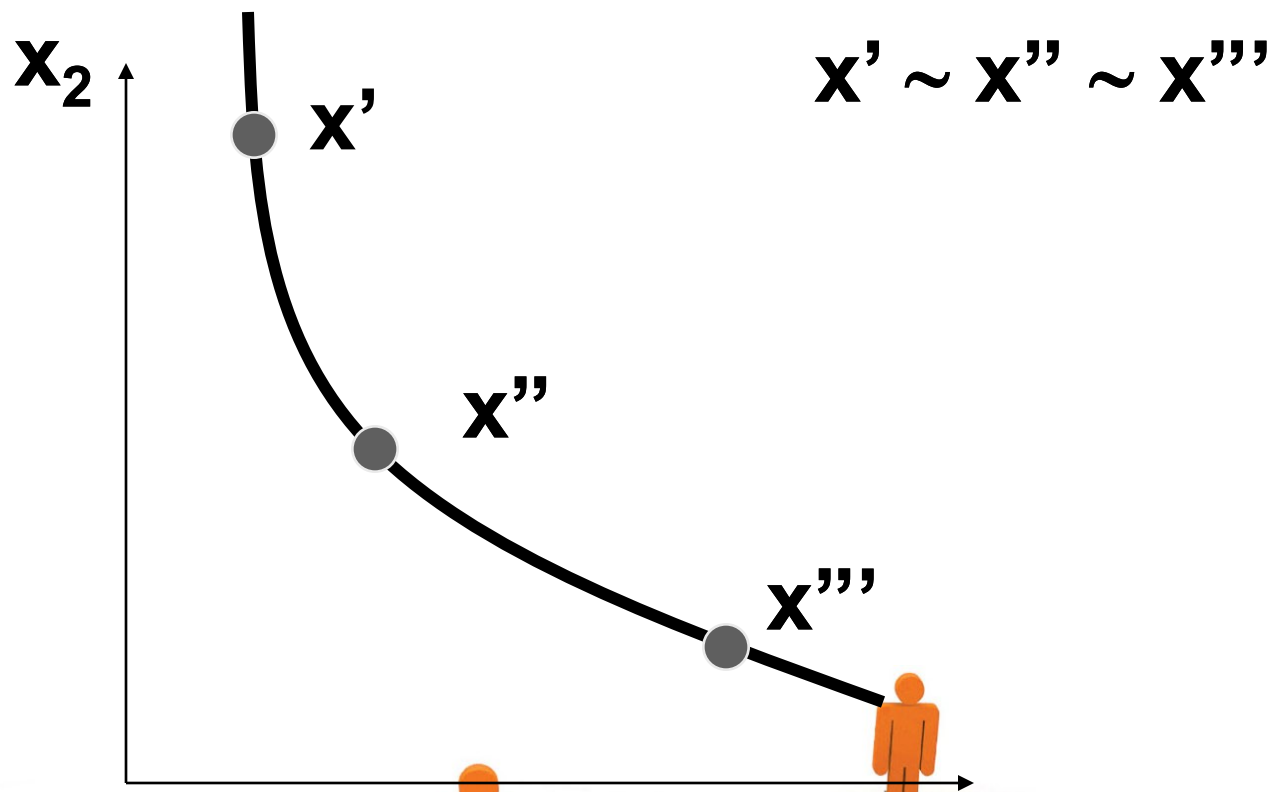


Indifference Curves

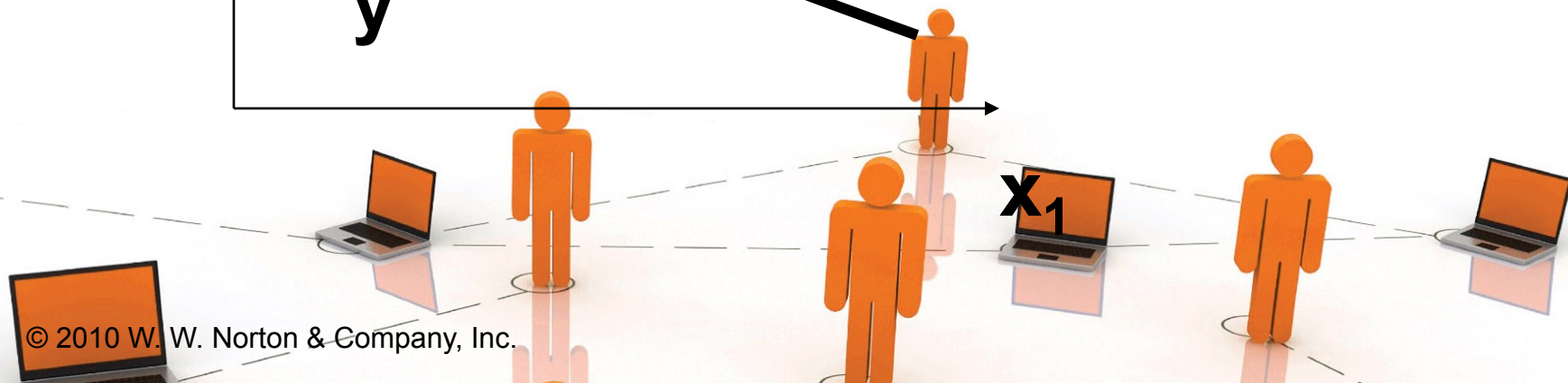
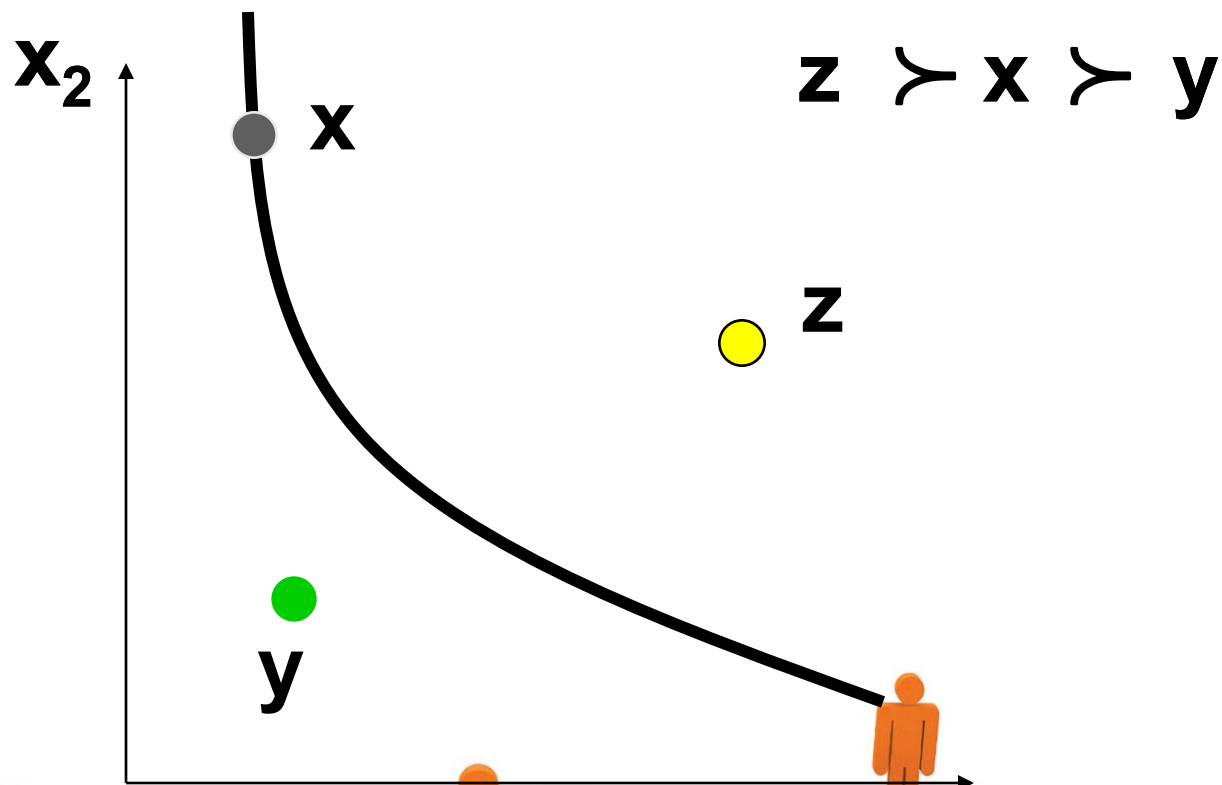
- ◆ Take a reference bundle x' . The set of all bundles equally preferred to x' is the indifference curve containing x' ; the set of all bundles $y \sim x'$.
- ◆ Since an indifference “curve” is not always a curve a better name might be an indifference “set”.



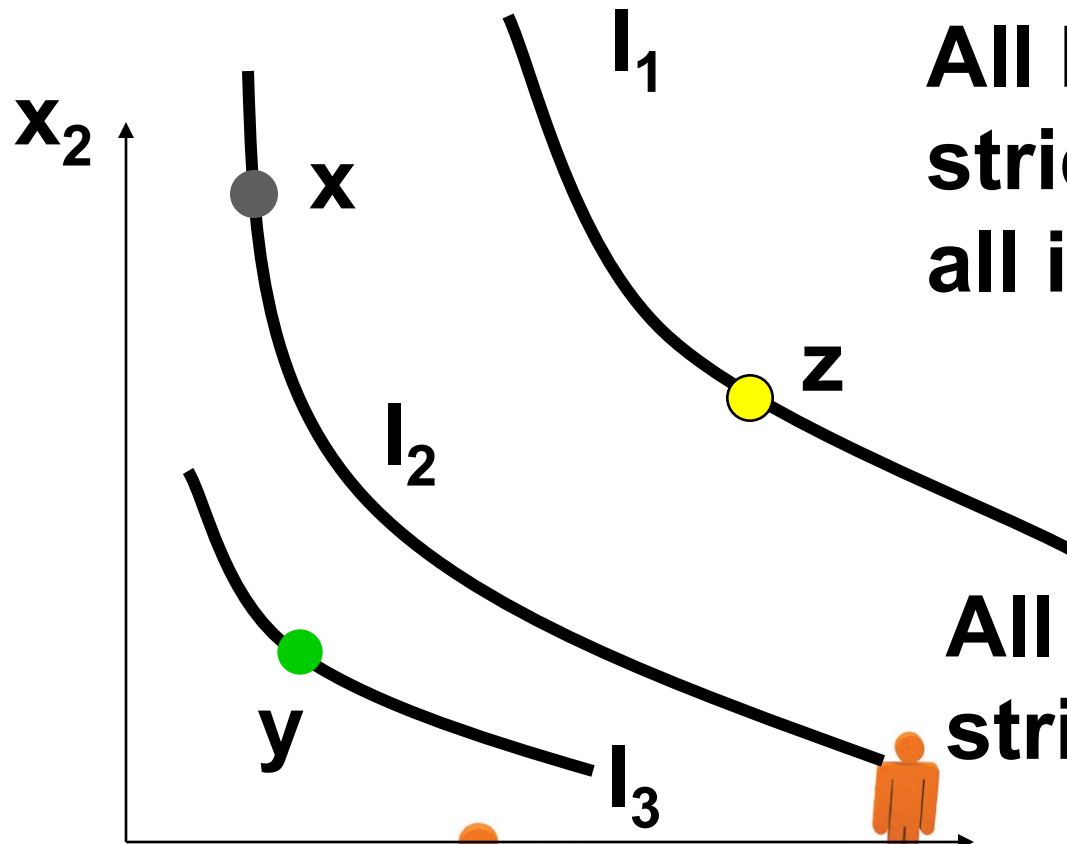
Indifference Curves



Indifference Curves

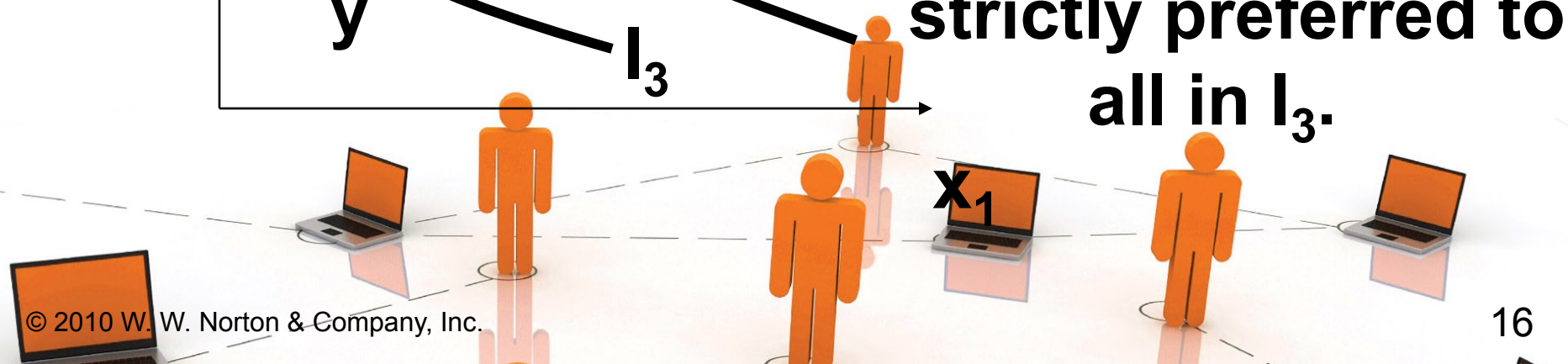


Indifference Curves

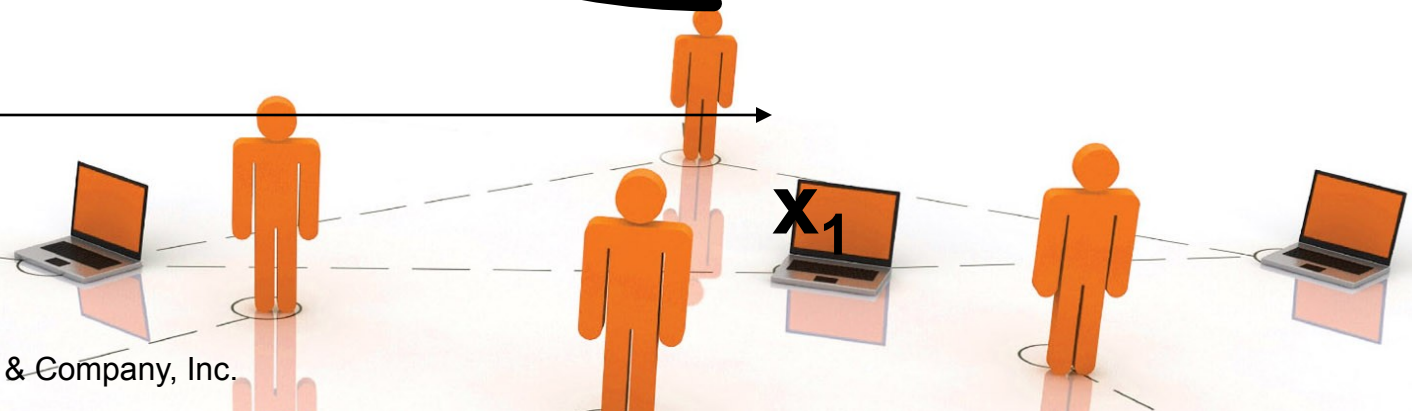
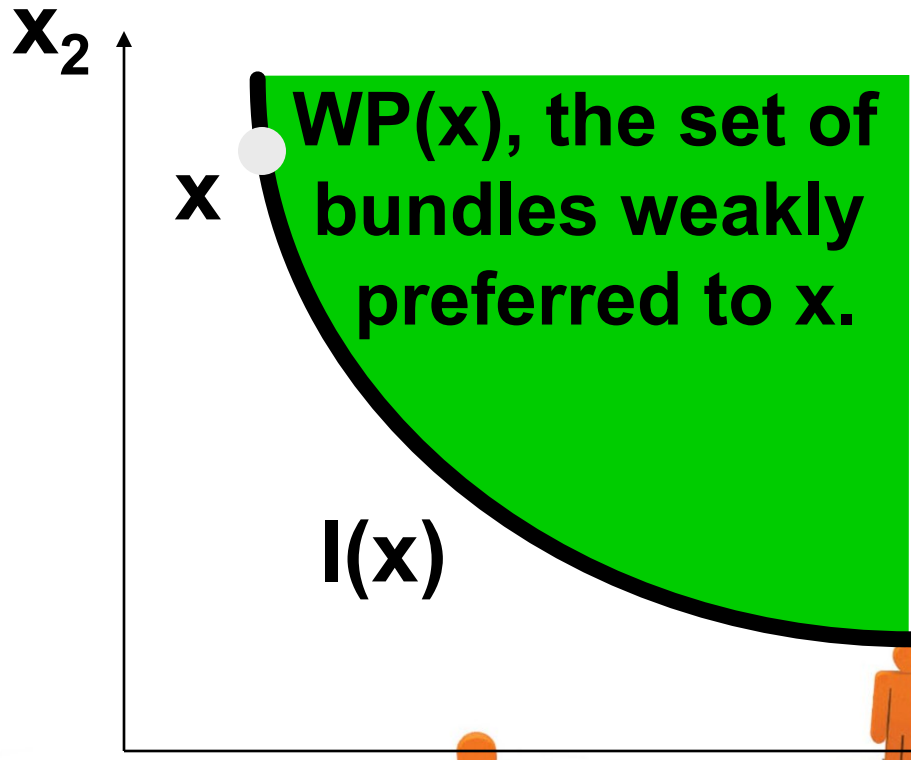


All bundles in I_1 are strictly preferred to all in I_2 .

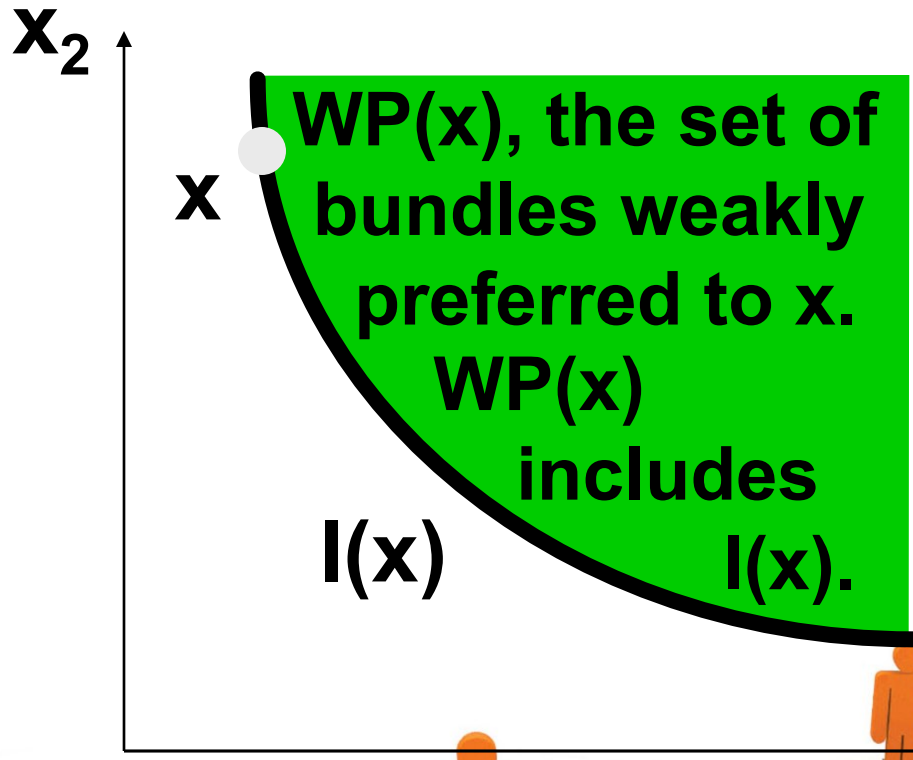
All bundles in I_2 are strictly preferred to all in I_3 .



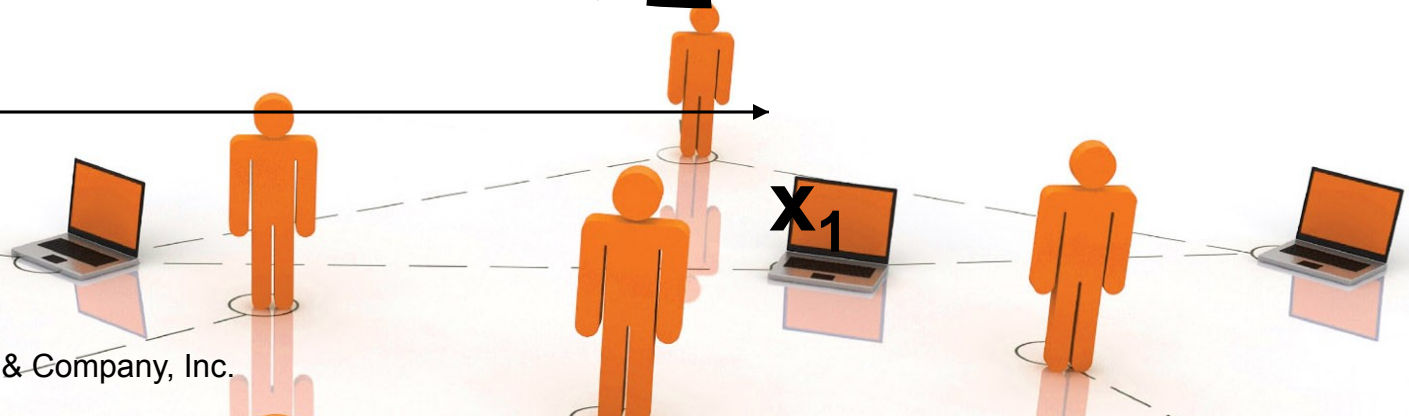
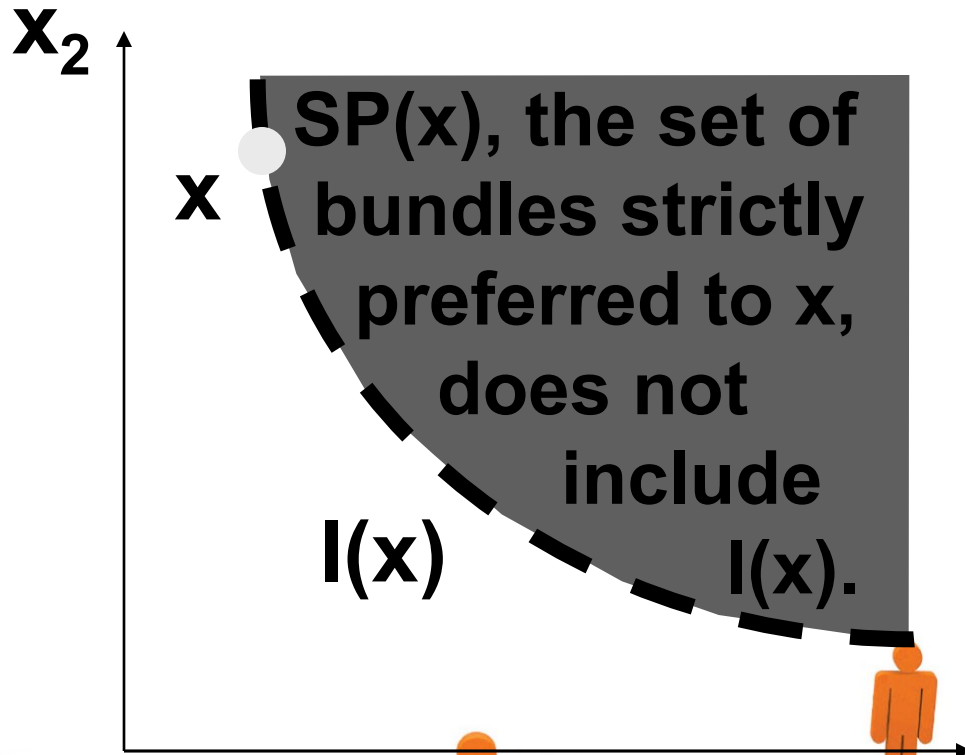
Indifference Curves



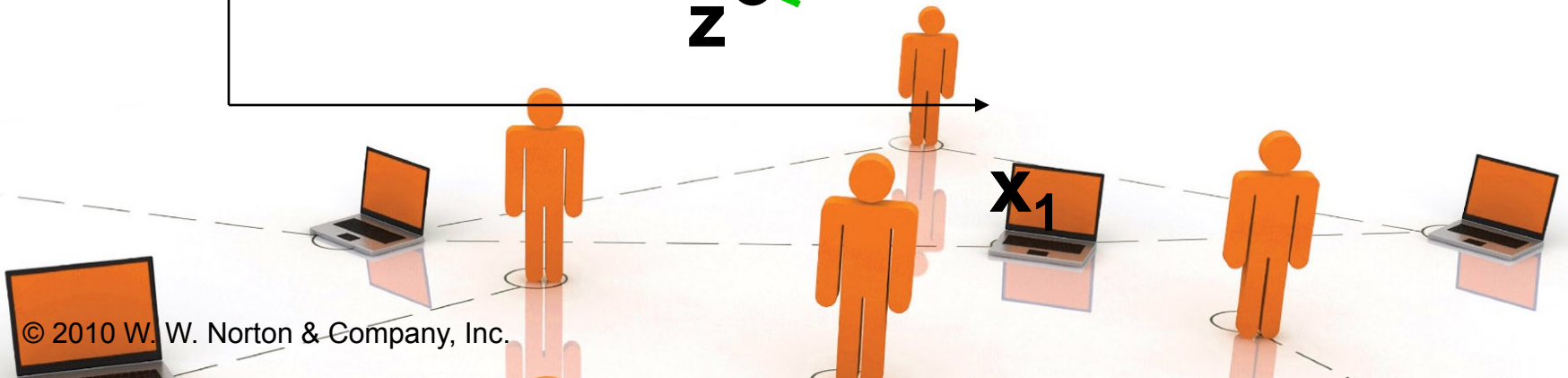
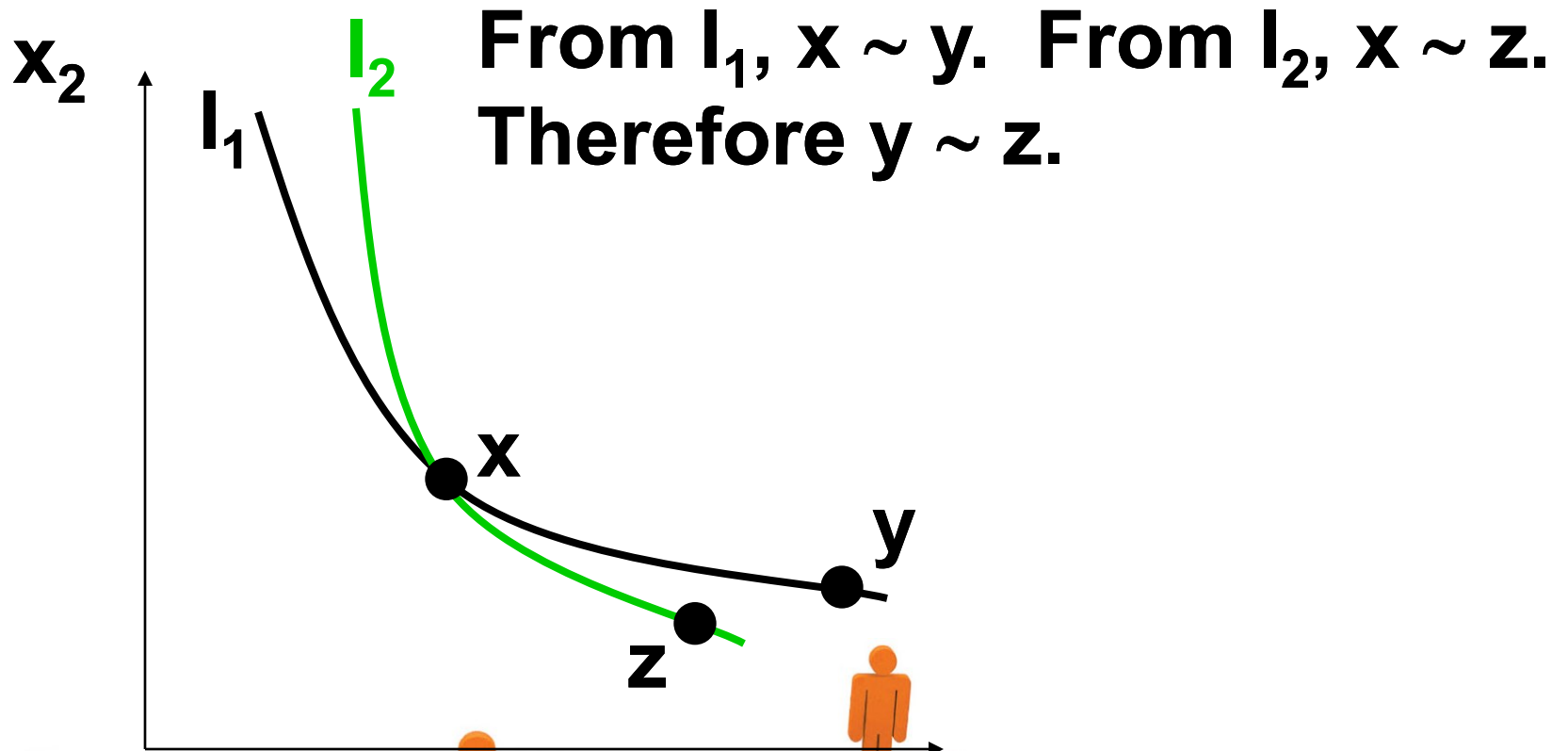
Indifference Curves



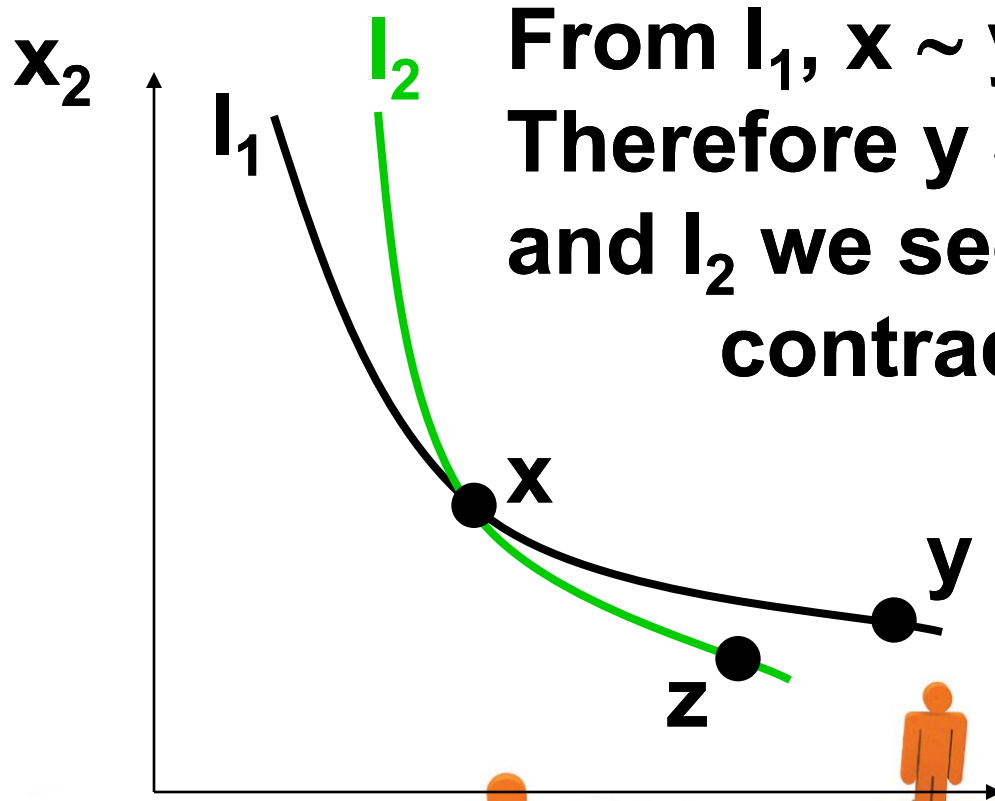
Indifference Curves



Indifference Curves Cannot Intersect



Indifference Curves Cannot Intersect



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.



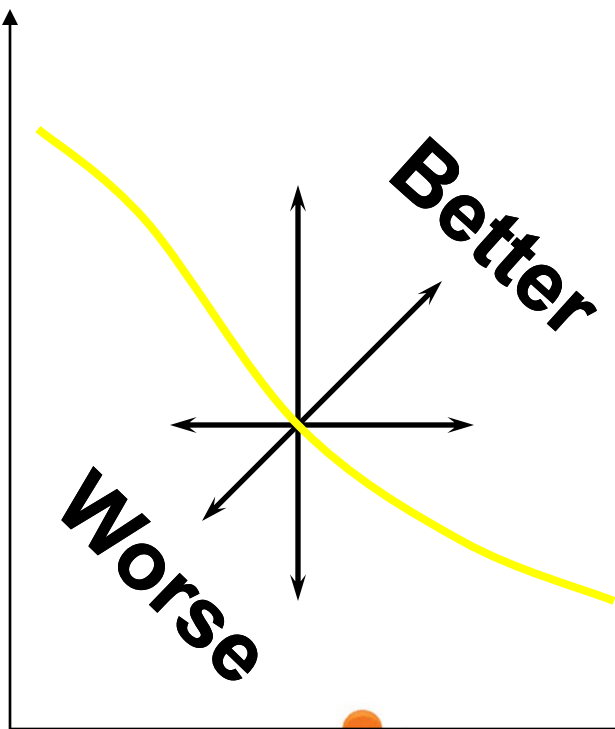
Slopes of Indifference Curves

- ◆ 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

Good 2



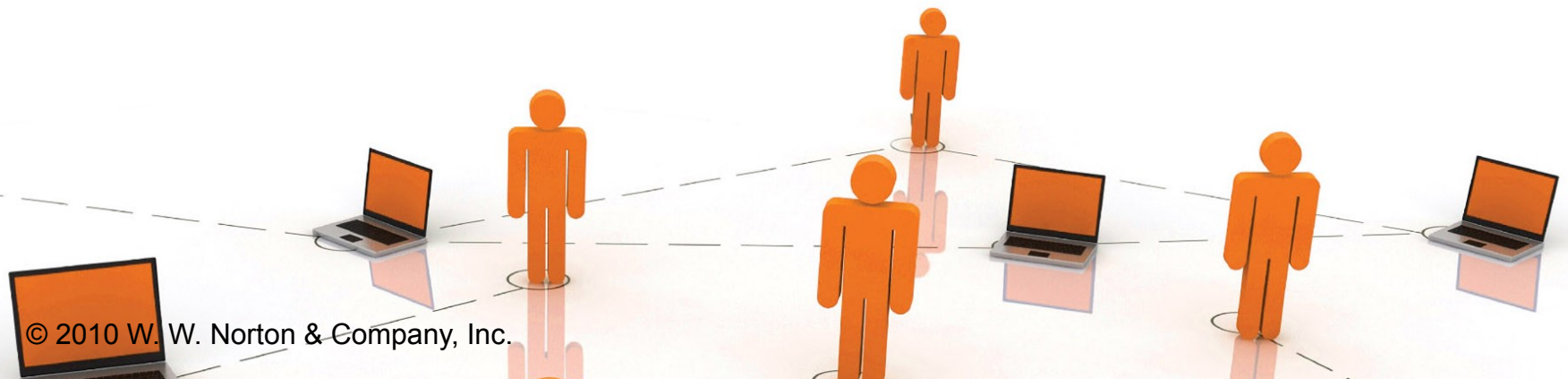
**Two goods →
a negatively sloped
indifference curve.**

Good 1



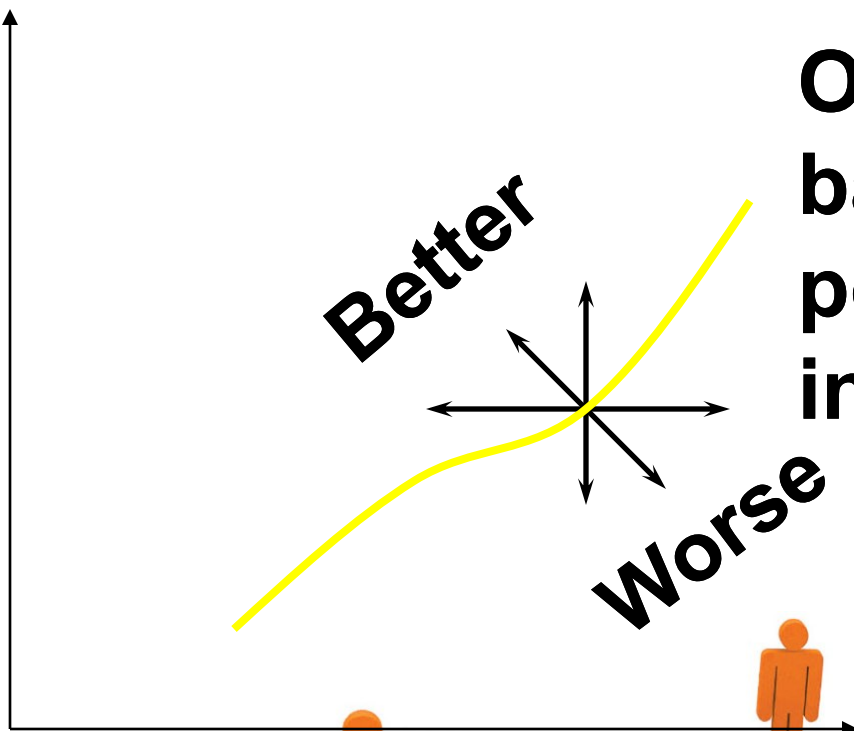
Slopes of Indifference Curves

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

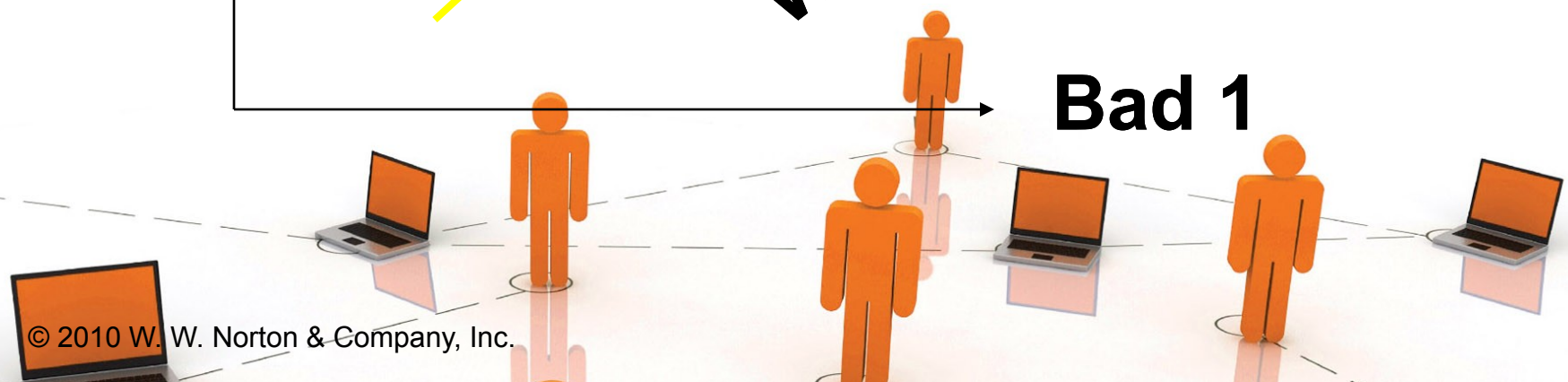


Slopes of Indifference Curves

Good 2

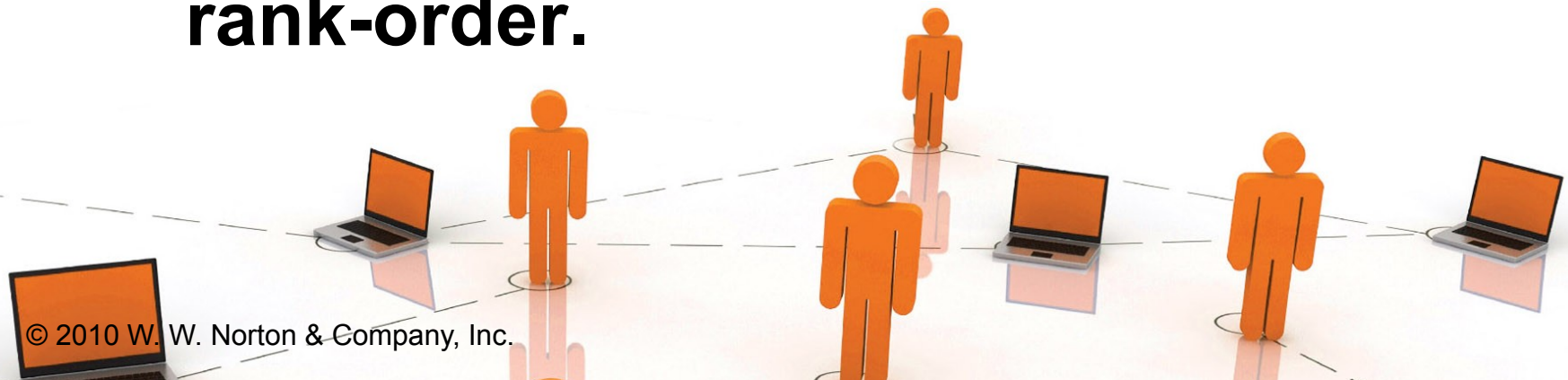


One good and one bad → a positively sloped indifference curve.

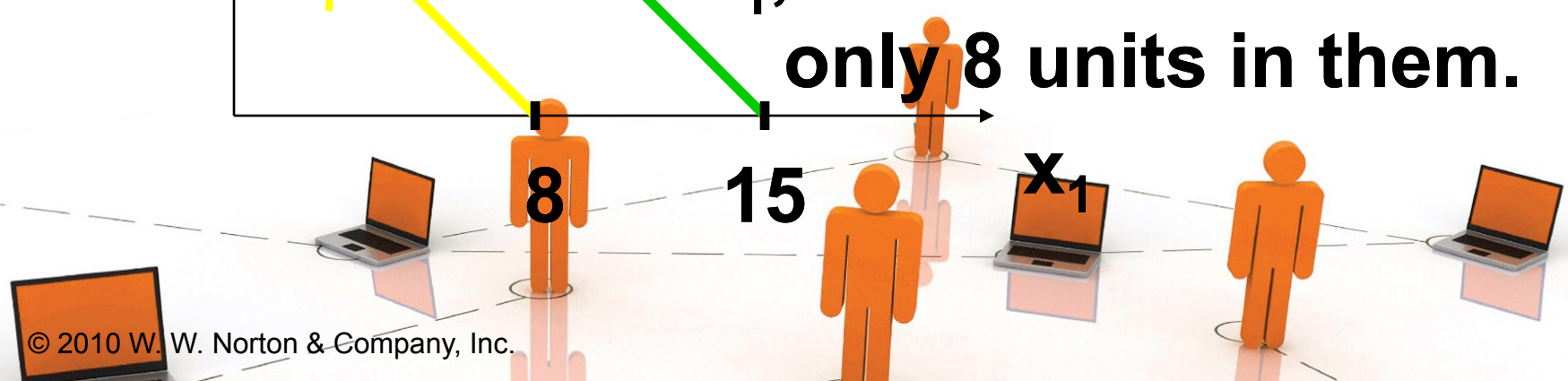
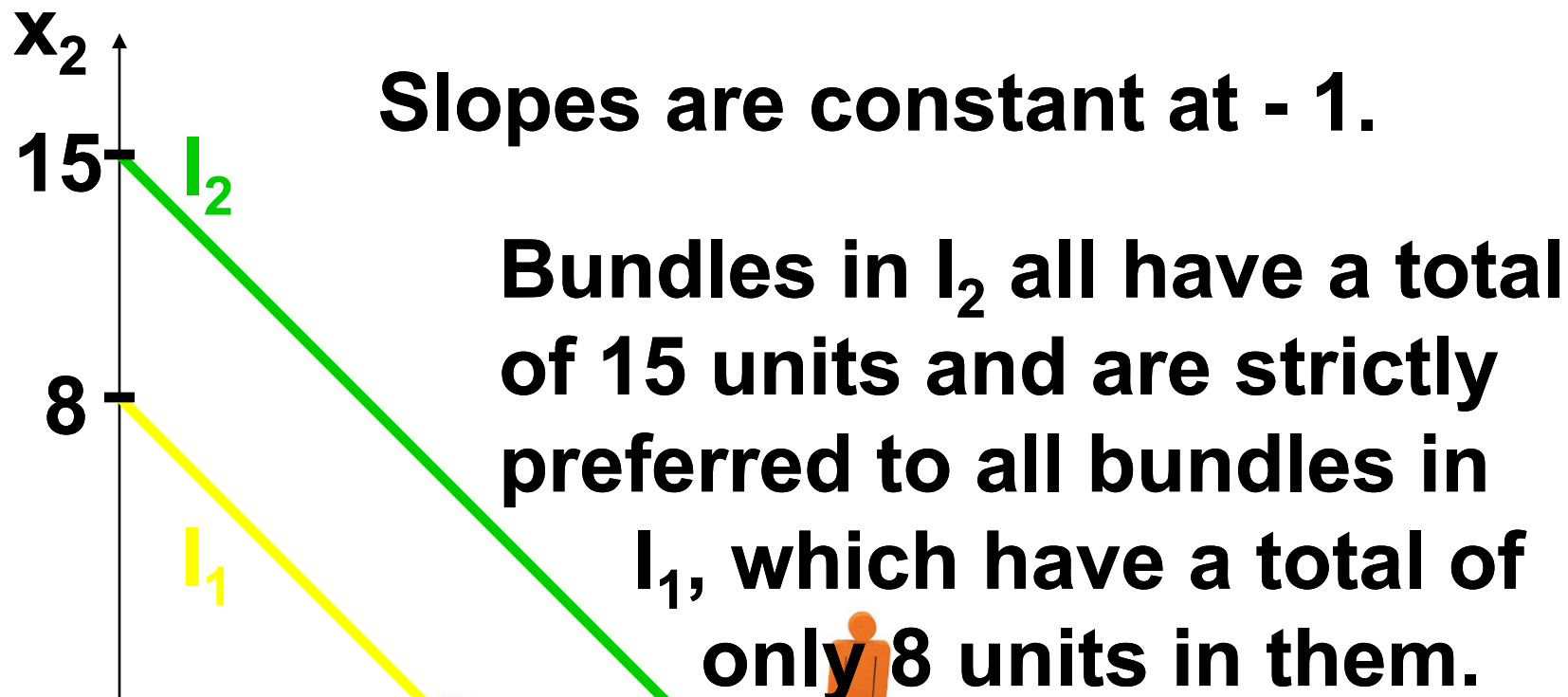


Extreme Cases of Indifference Curves; Perfect Substitutes

- ◆ 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

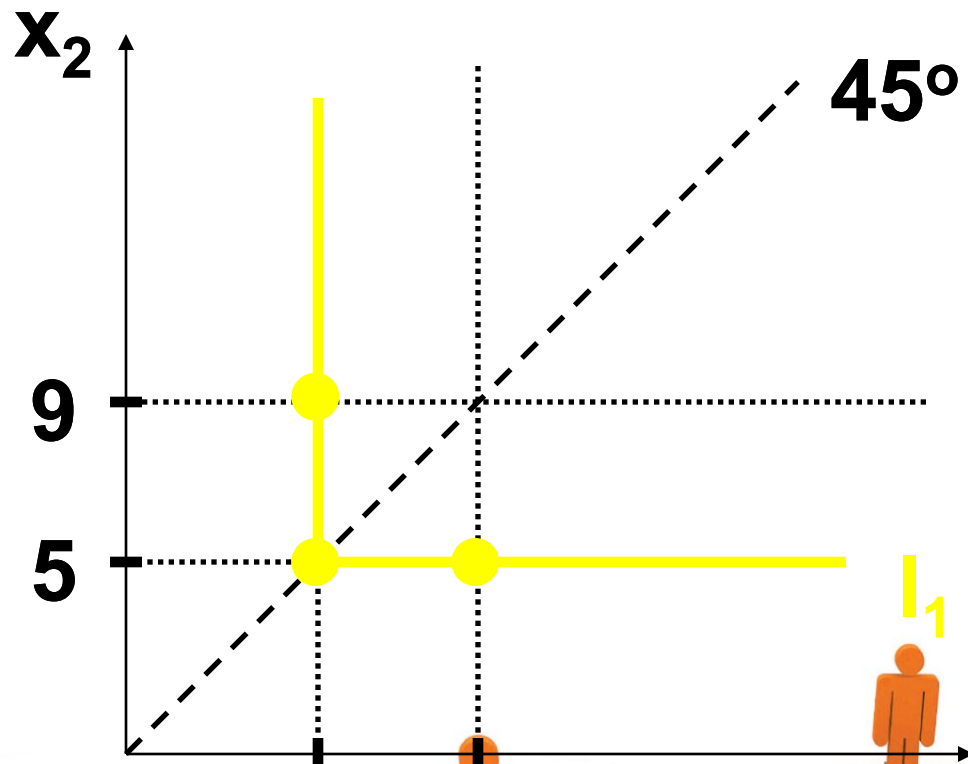


Extreme Cases of Indifference Curves; Perfect Complements

- ◆ 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.



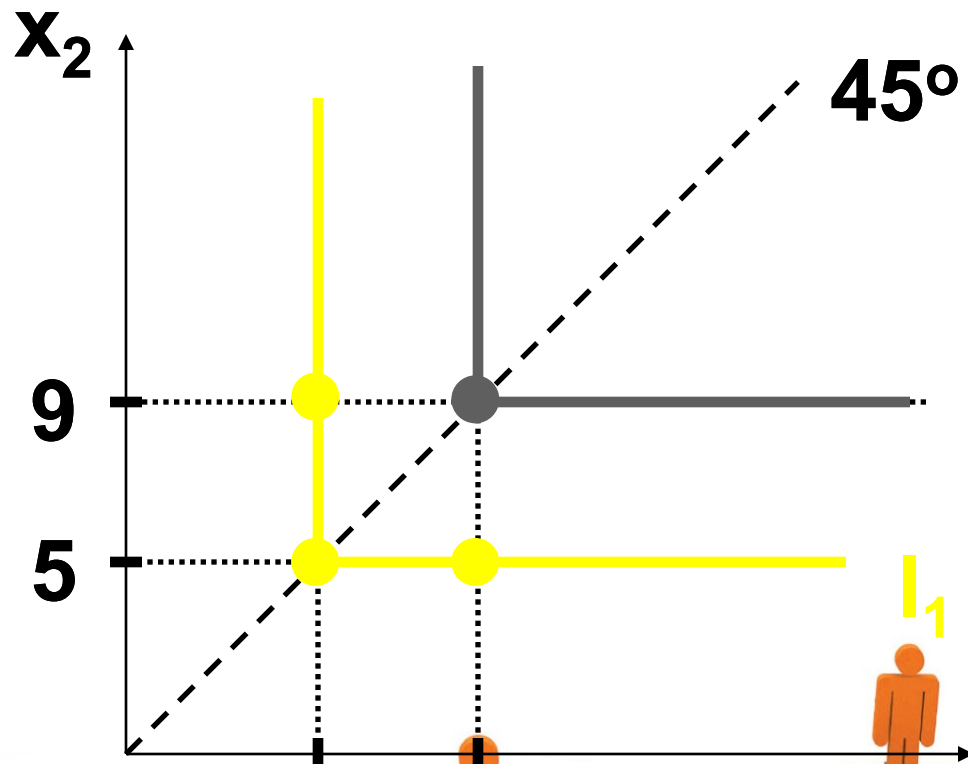
Extreme Cases of Indifference Curves; Perfect Complements



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



Extreme Cases of Indifference Curves; Perfect Complements

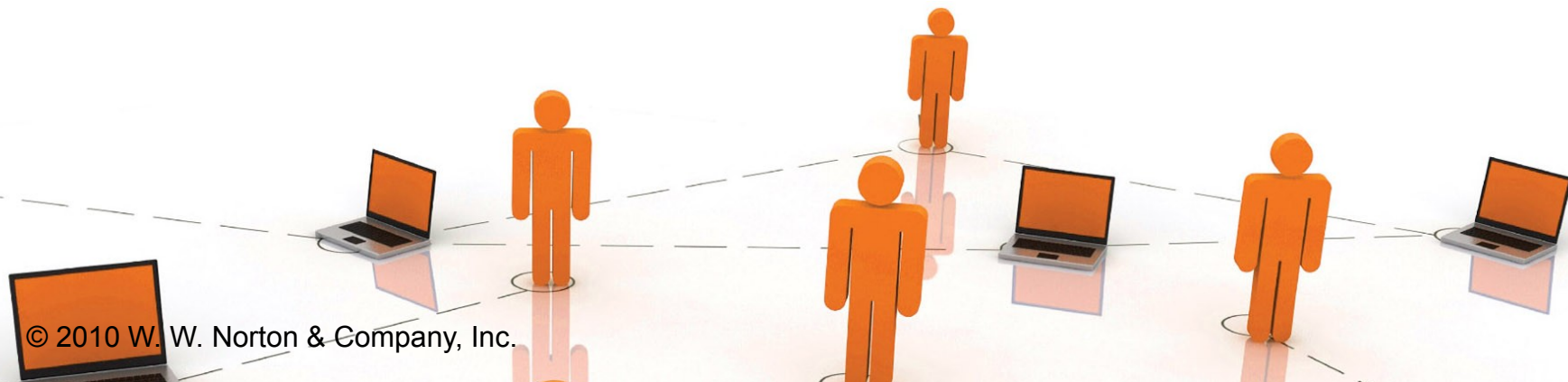


Since each of $(5,5)$, $(5,9)$ and $(9,5)$ contains 5 pairs, each is less preferred than the bundle $(9,9)$ which contains 9 pairs.

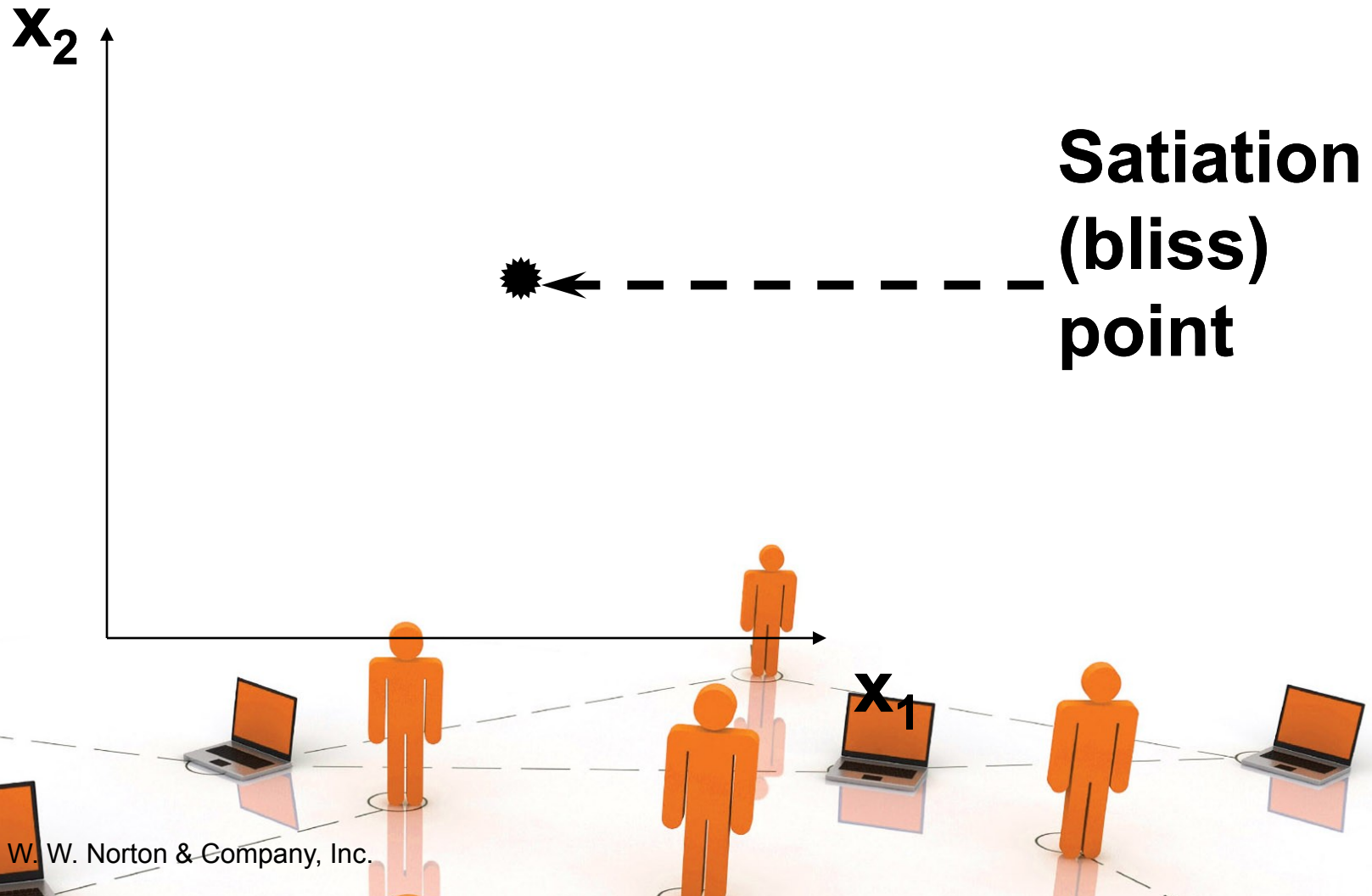


Preferences Exhibiting Satiation

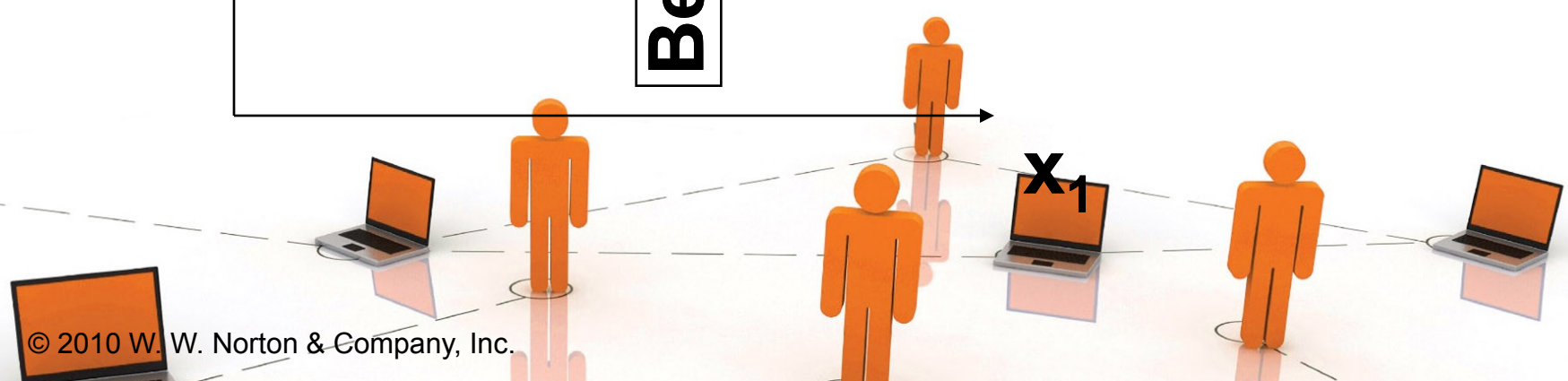
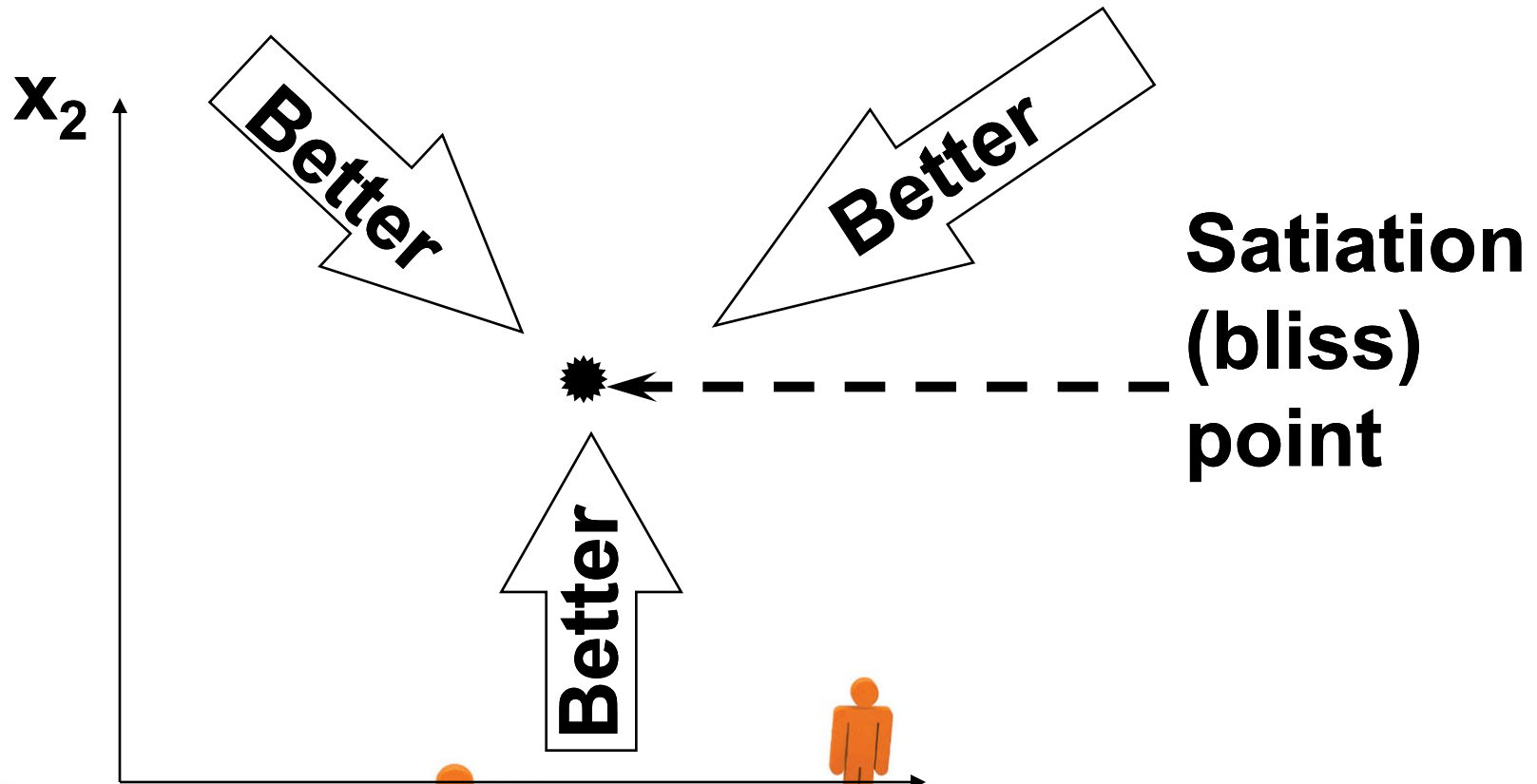
- ◆ A bundle strictly preferred to any other is a **satiation point** or a **bliss point**.
- ◆ What do indifference curves look like for preferences exhibiting satiation?



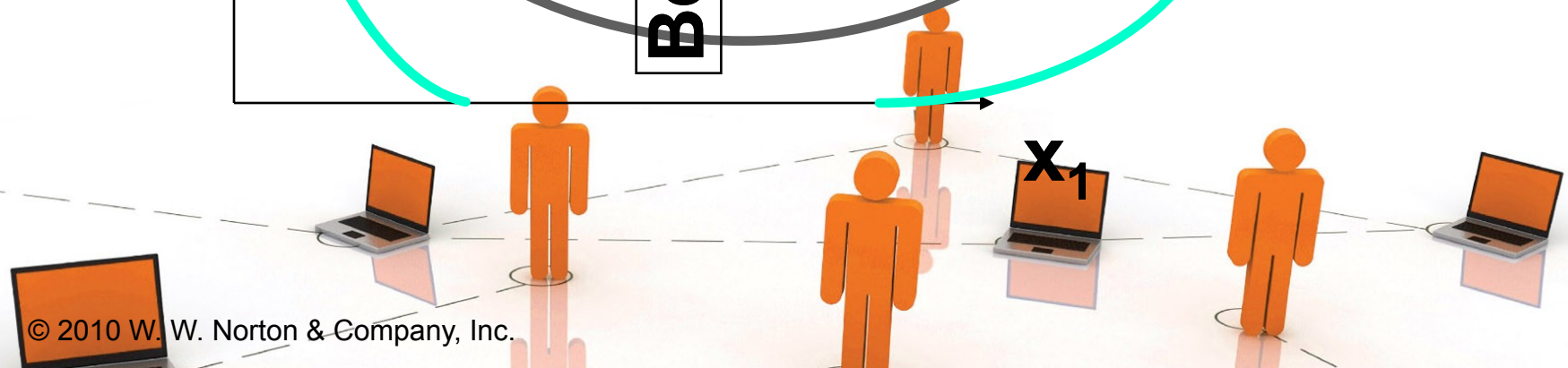
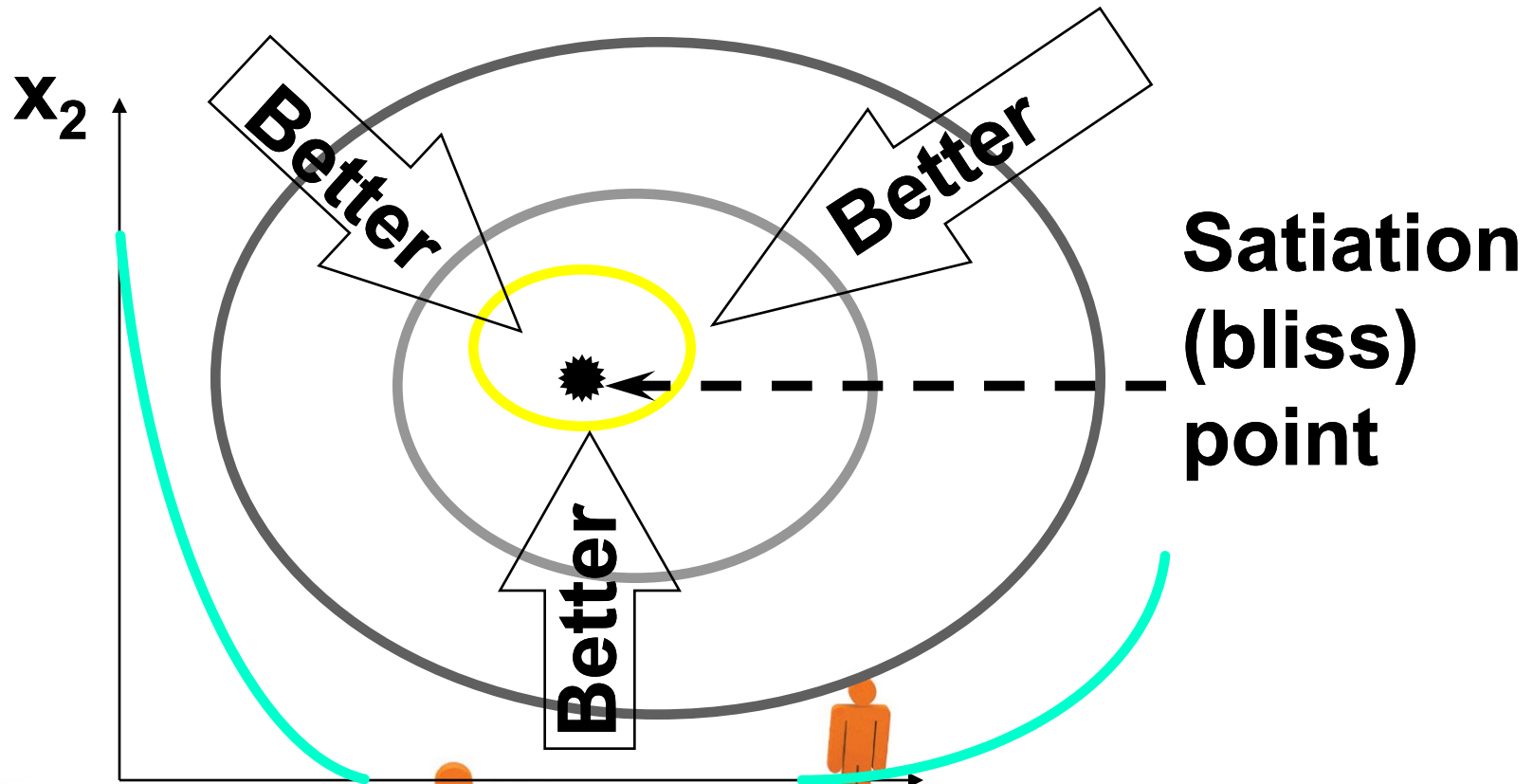
Indifference Curves Exhibiting Satiation



Indifference Curves Exhibiting Satiation

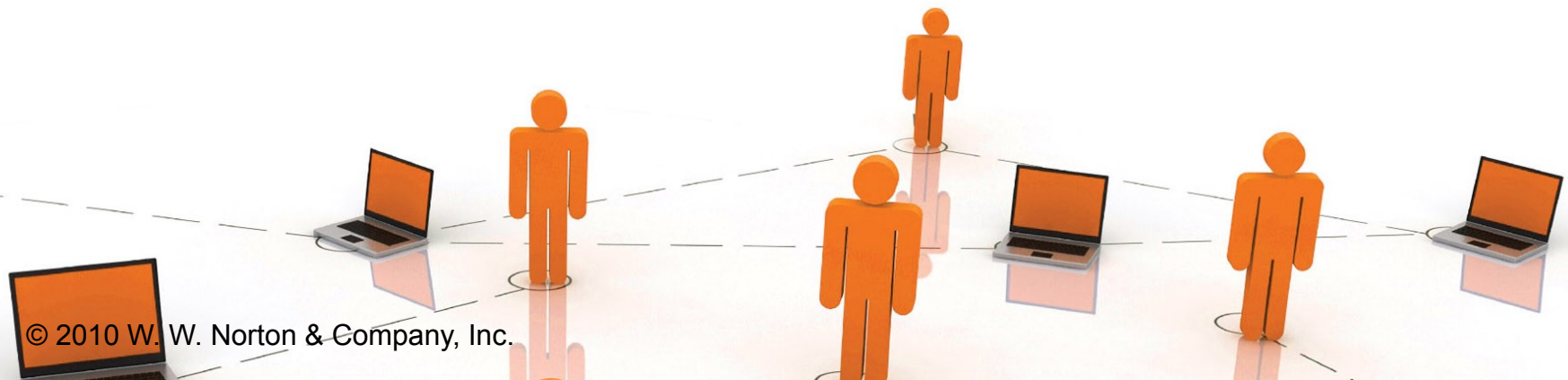


Indifference Curves Exhibiting Satiation



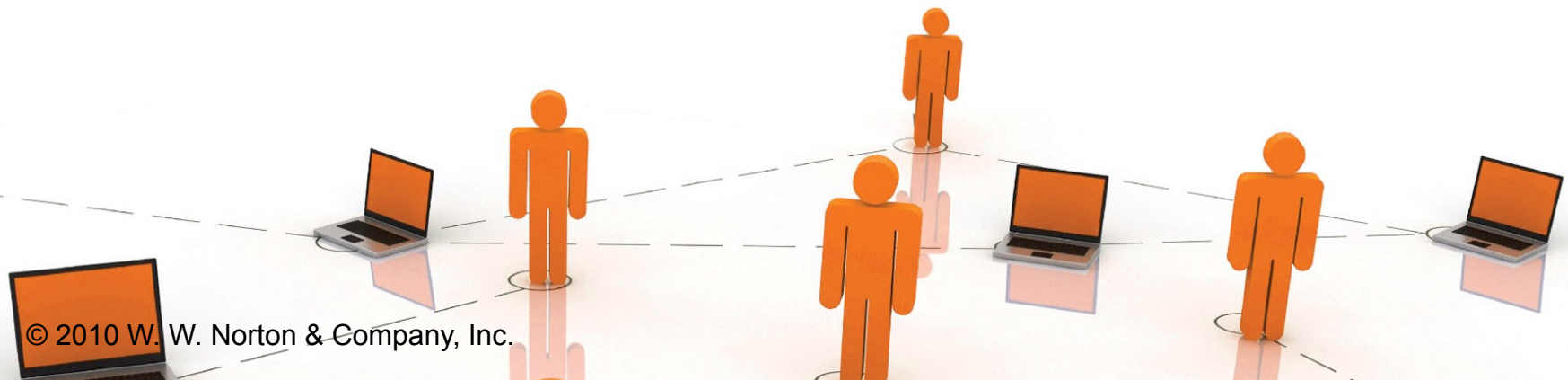
Indifference Curves for Discrete Commodities

- ◆ 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.



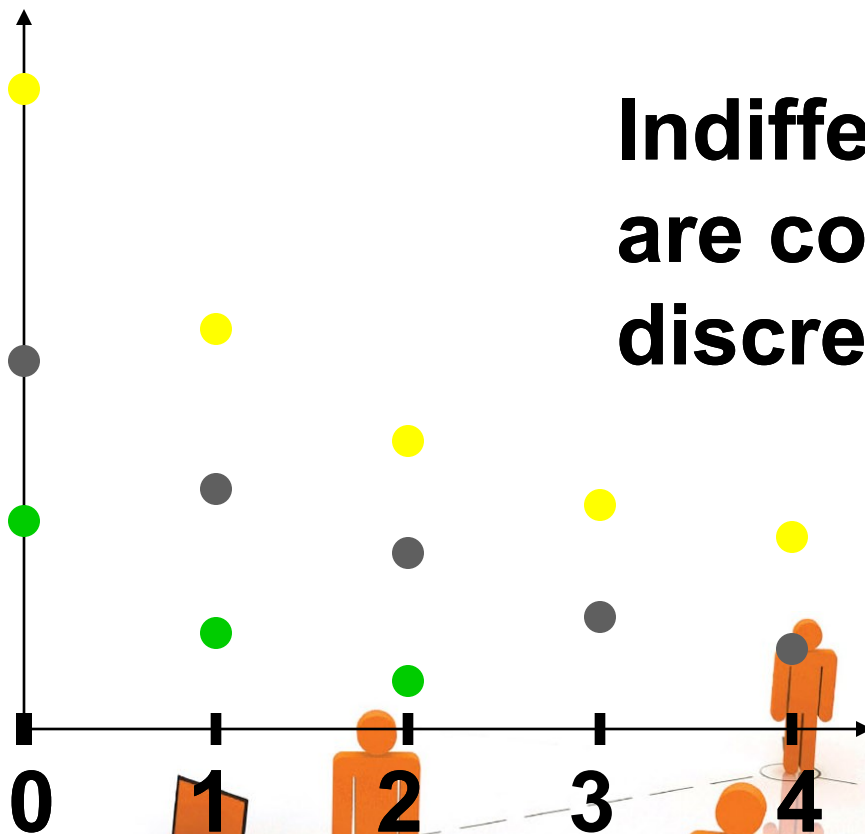
Indifference Curves for Discrete Commodities

- ◆ 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

Gasoline

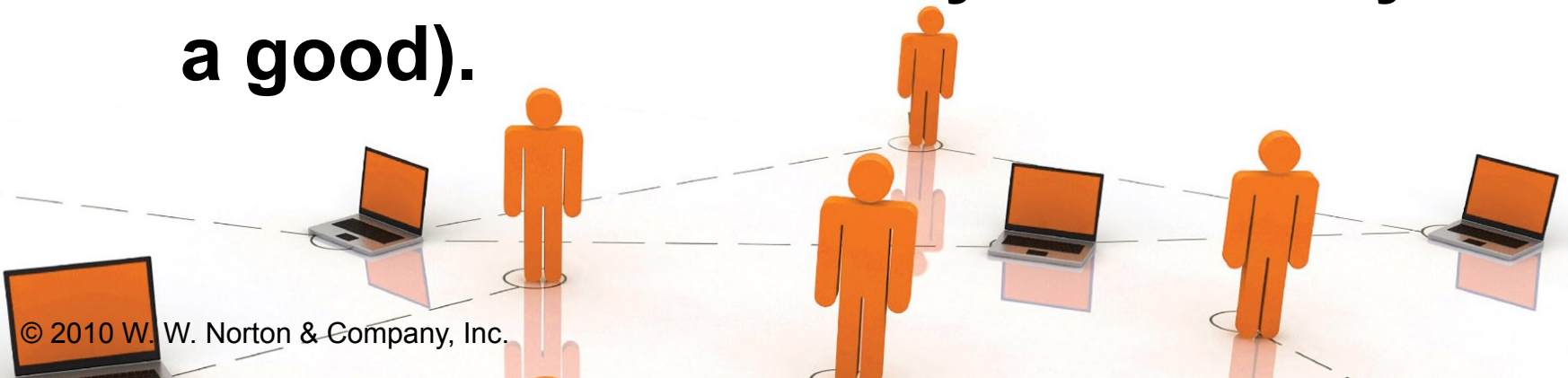


Indifference “curves” are collections of discrete points.

Aircraft

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).

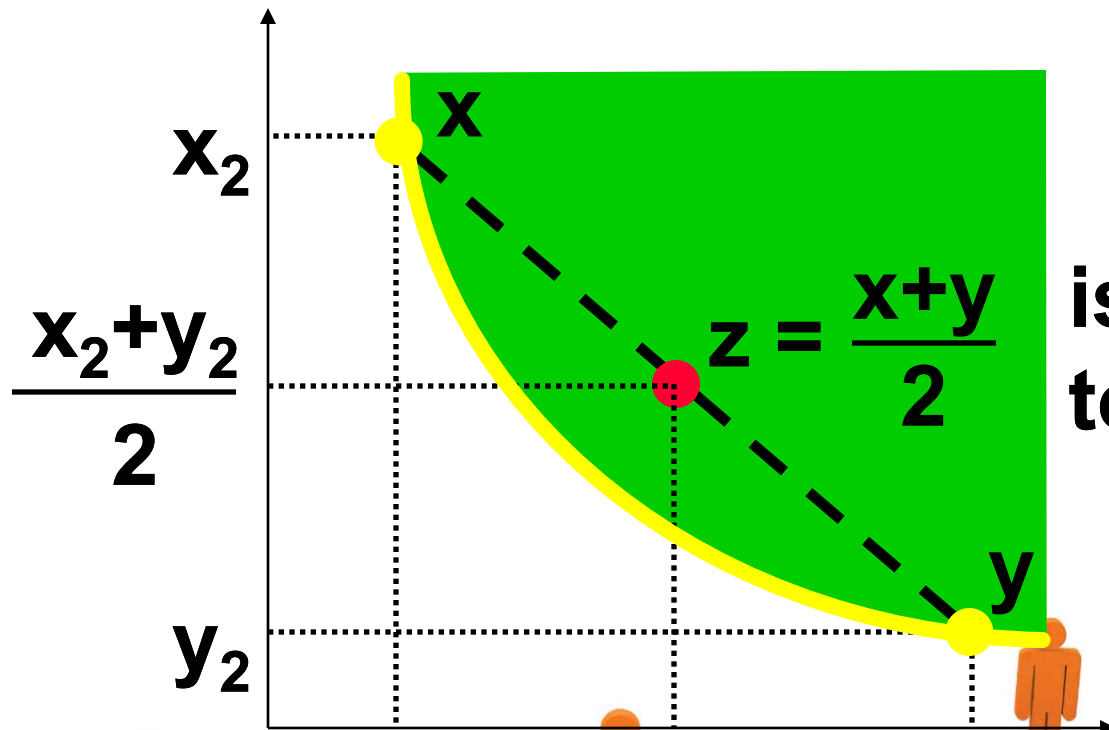


Well-Behaved Preferences

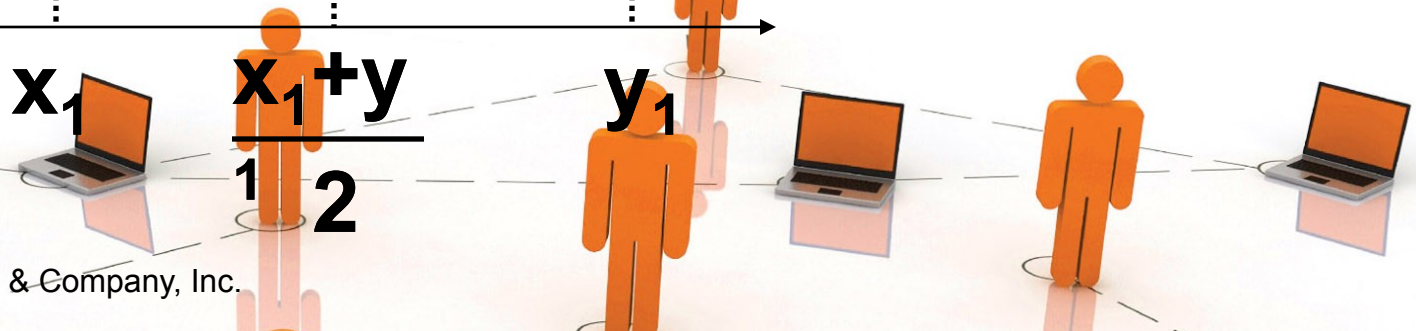
- ◆ **Convexity: Mixtures of bundles are (at least weakly) preferred to the bundles themselves. E.g., the 50-50 mixture of the bundles x and y is $z = (0.5)x + (0.5)y$. z is at least as preferred as x or y .**



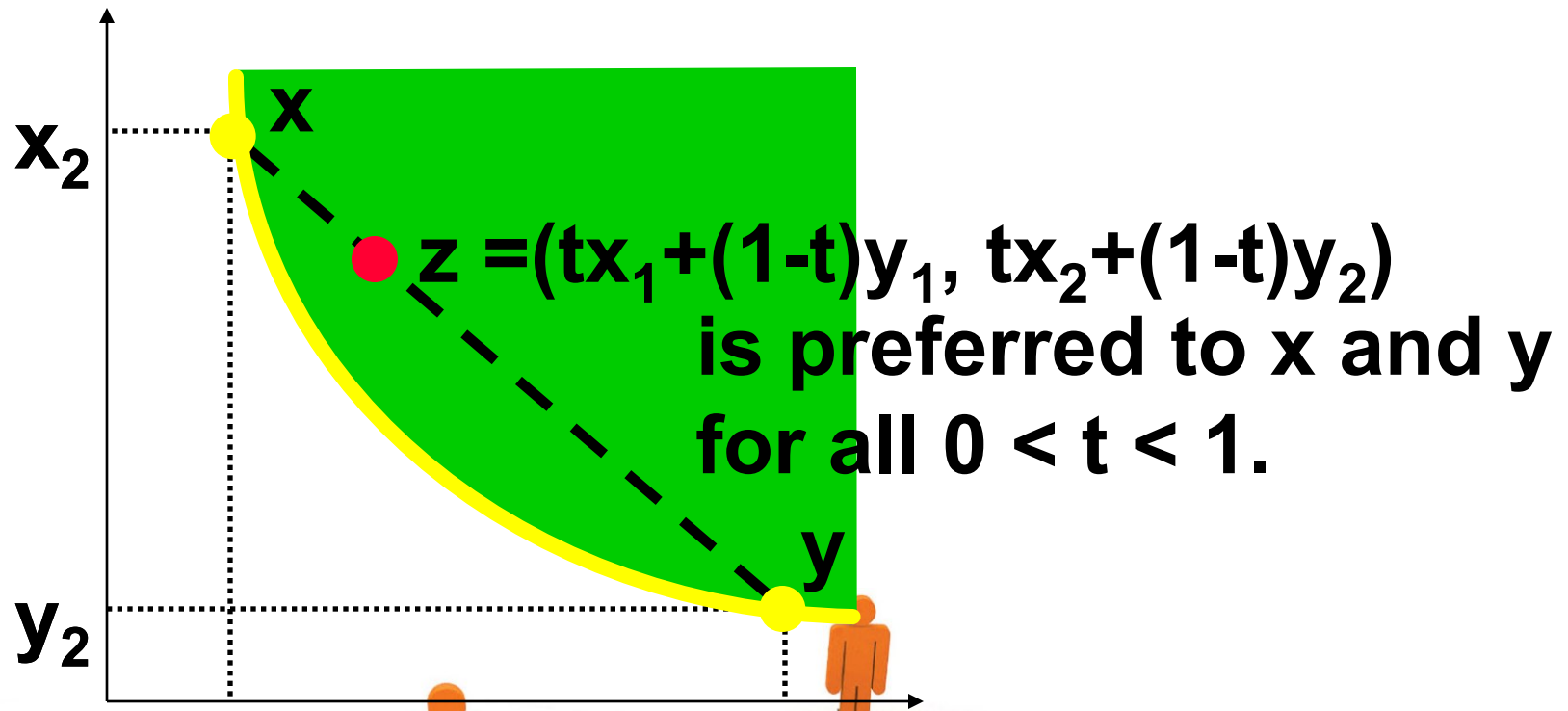
Well-Behaved Preferences -- Convexity.



is strictly preferred to both x and y .

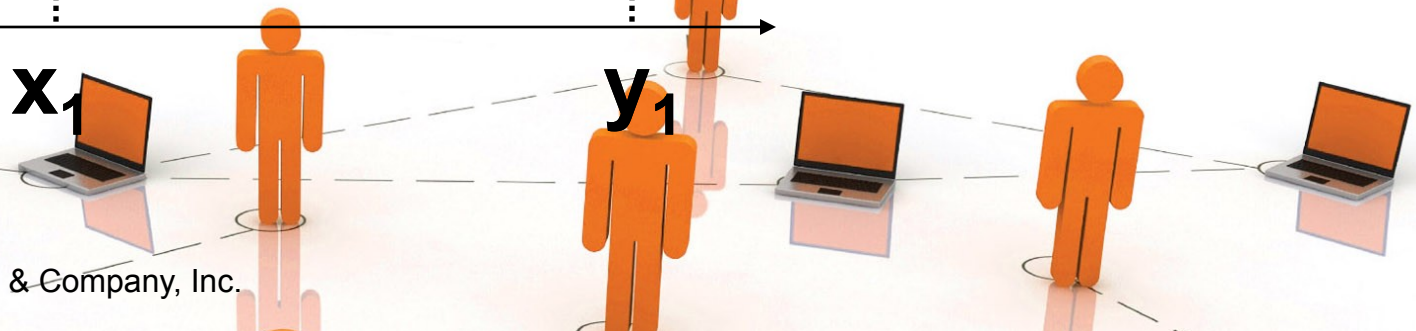
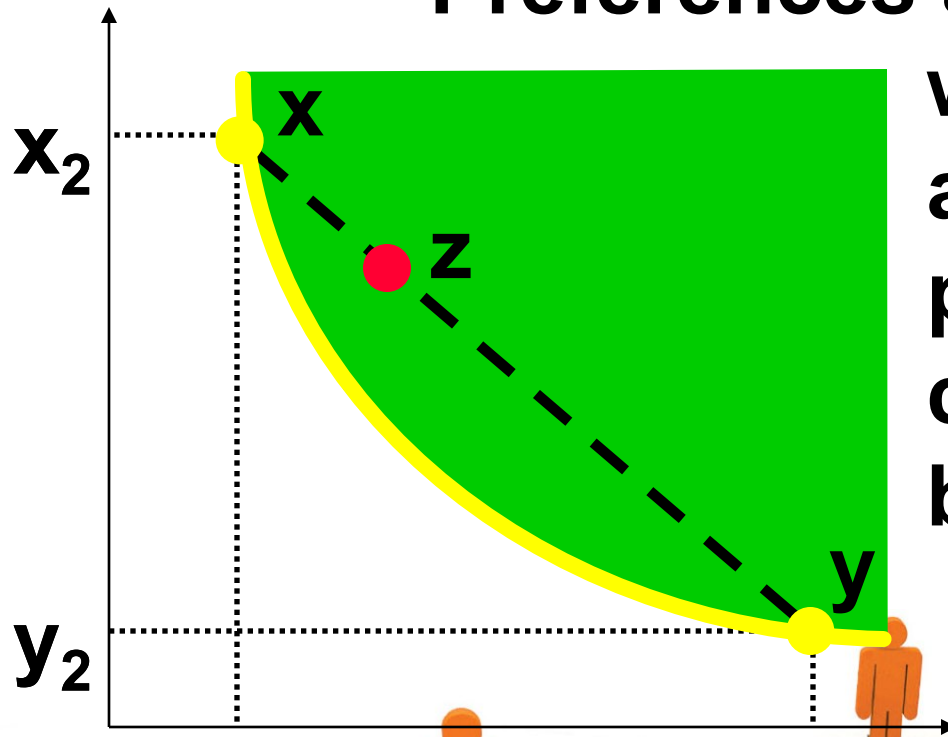


Well-Behaved Preferences -- Convexity.

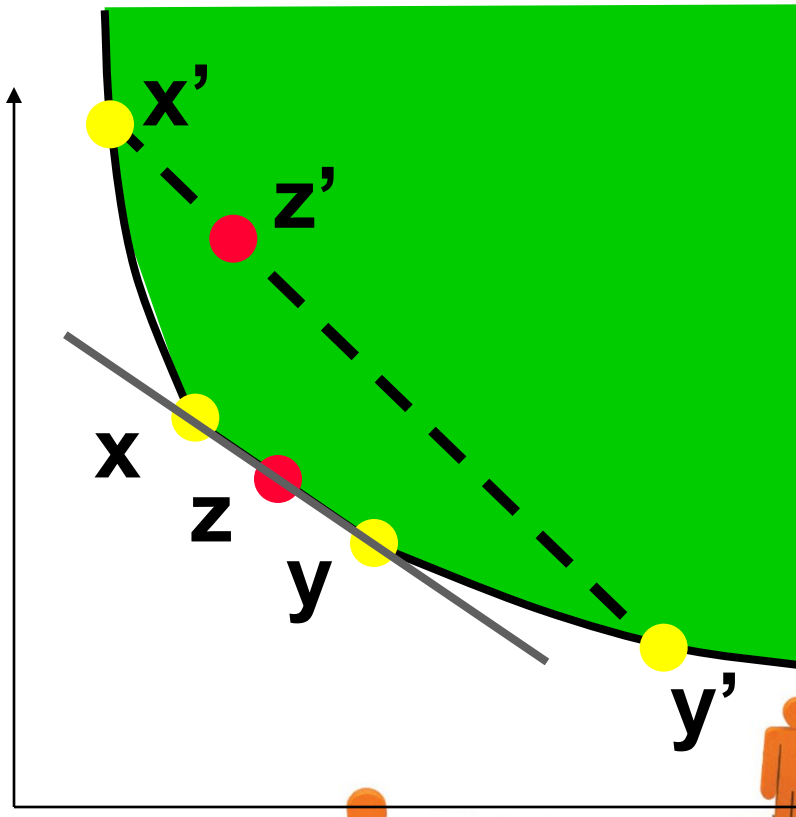


Well-Behaved Preferences -- Convexity.

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

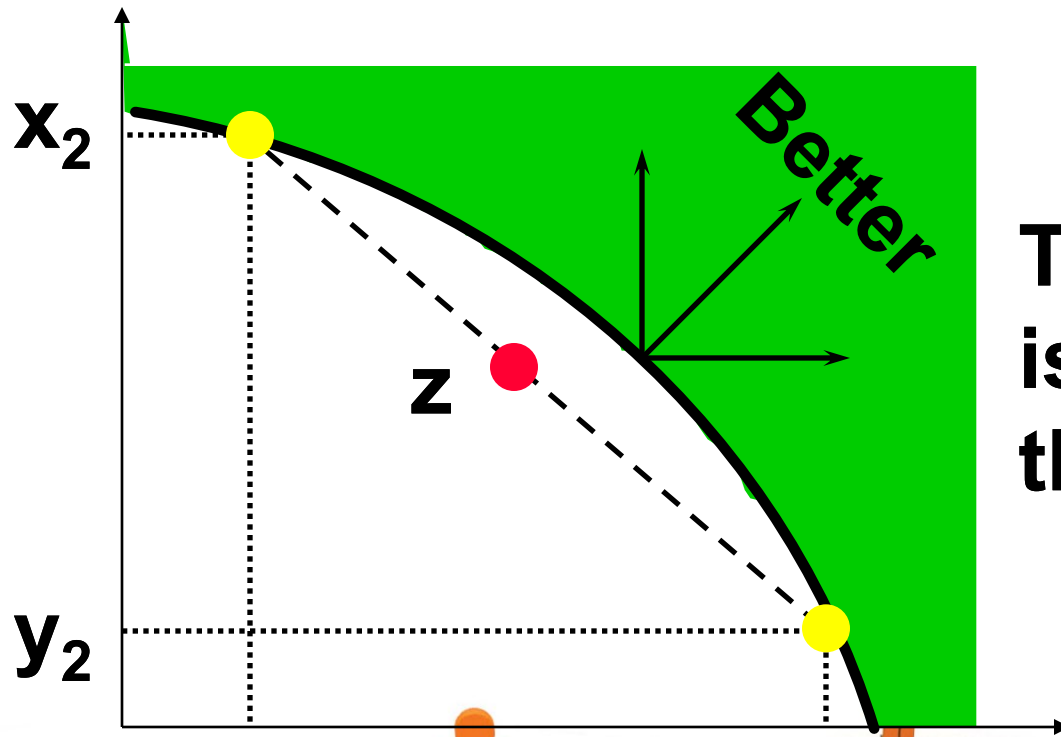


Well-Behaved Preferences -- Weak Convexity.



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

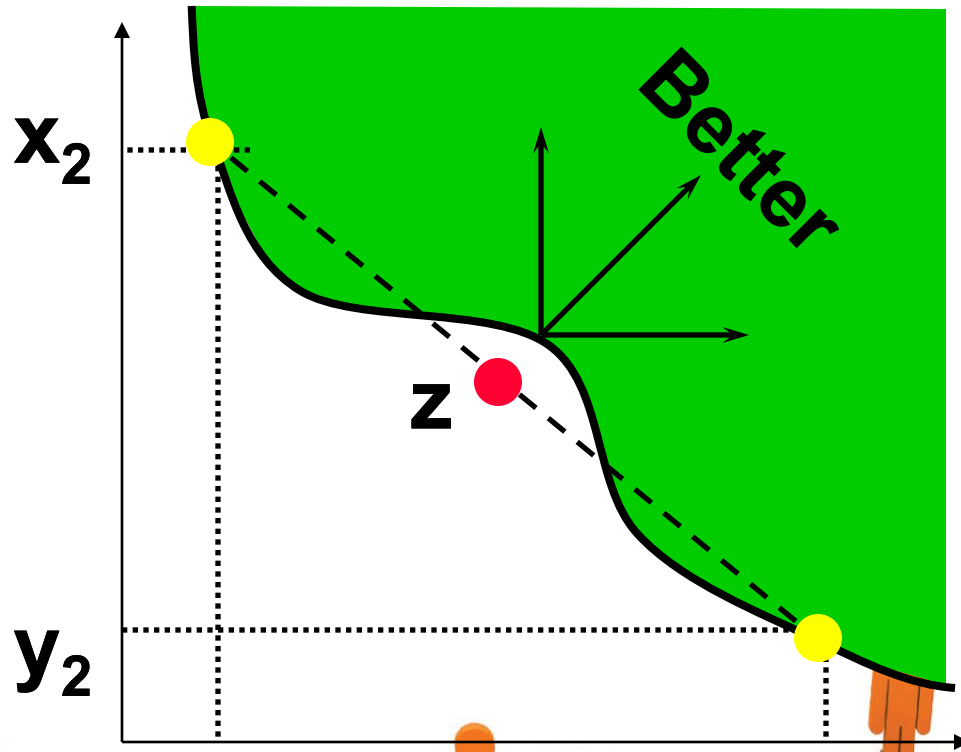
Non-Convex Preferences



The mixture z is less preferred than x or y .



More Non-Convex Preferences



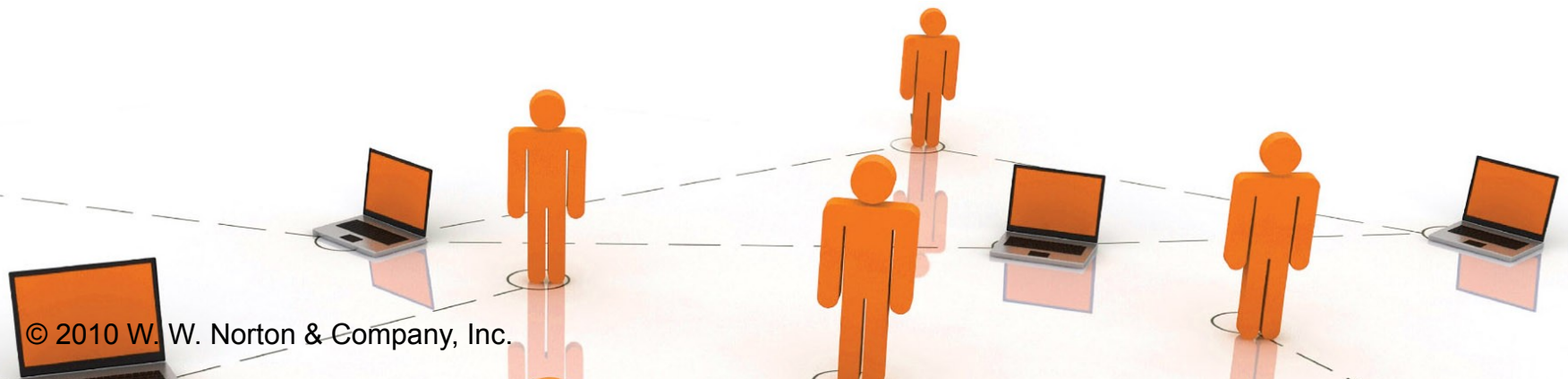
The mixture z is less preferred than x or y .

x_1

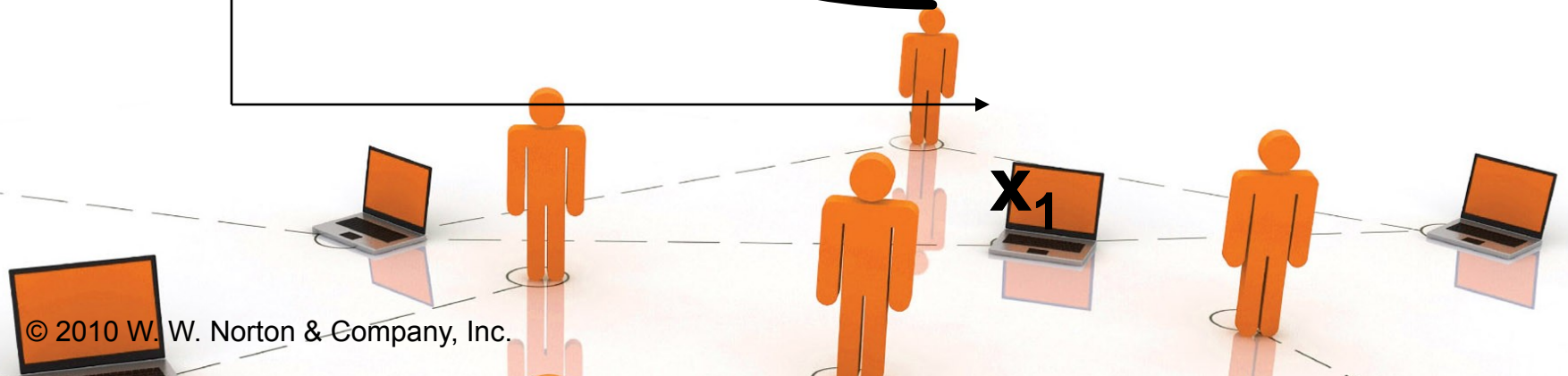
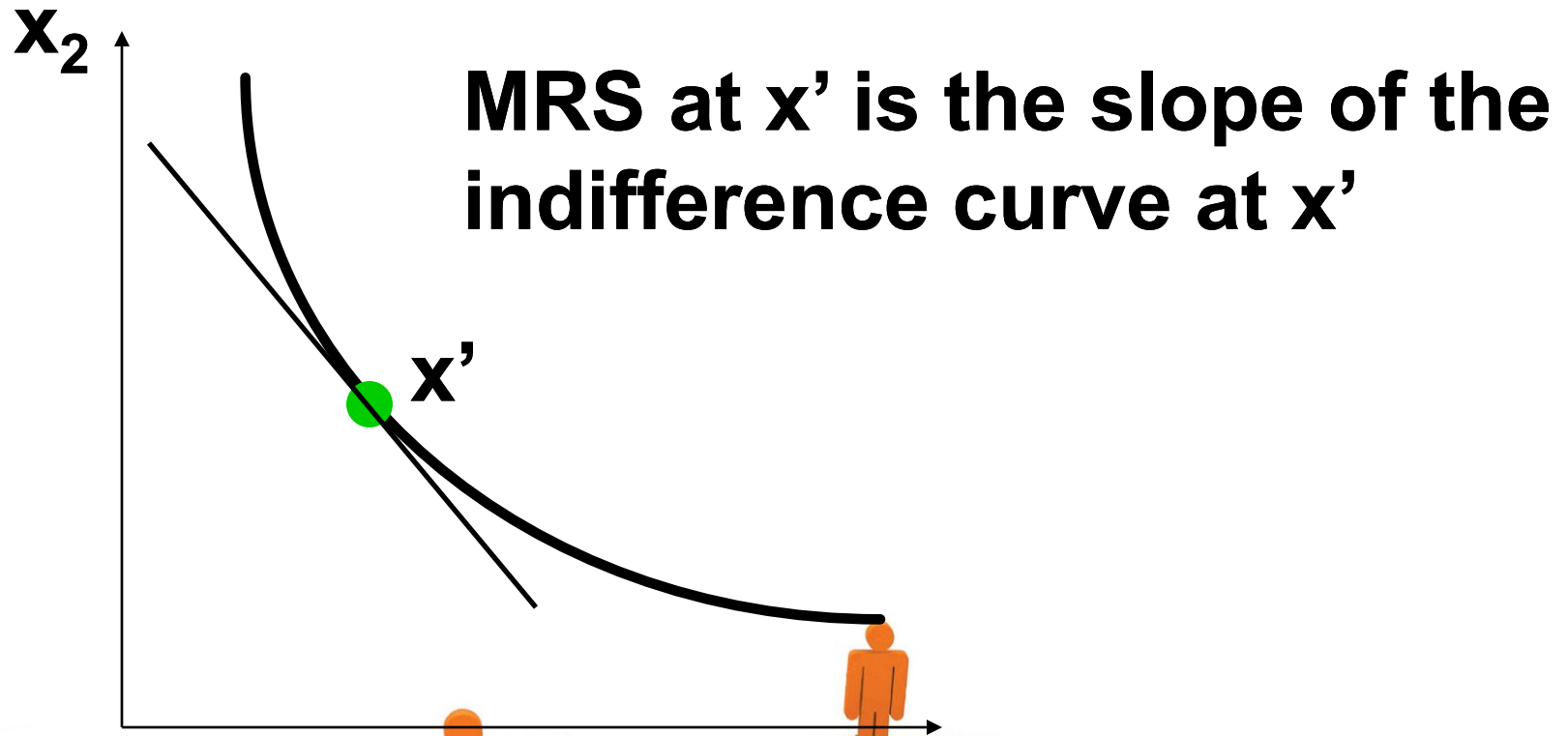
y_1

Slopes of Indifference Curves

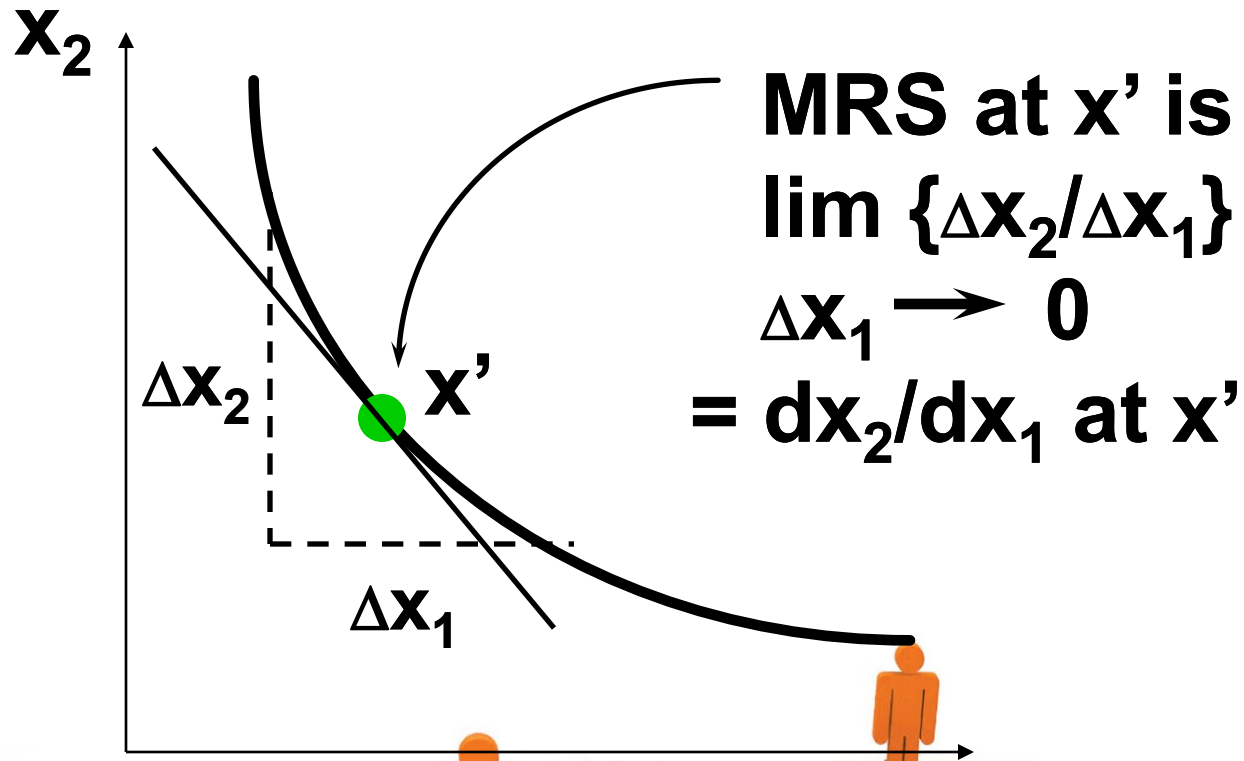
- ◆ The slope of an indifference curve is its **marginal rate-of-substitution (MRS)**.
- ◆ How can a MRS be calculated?



Marginal Rate of Substitution

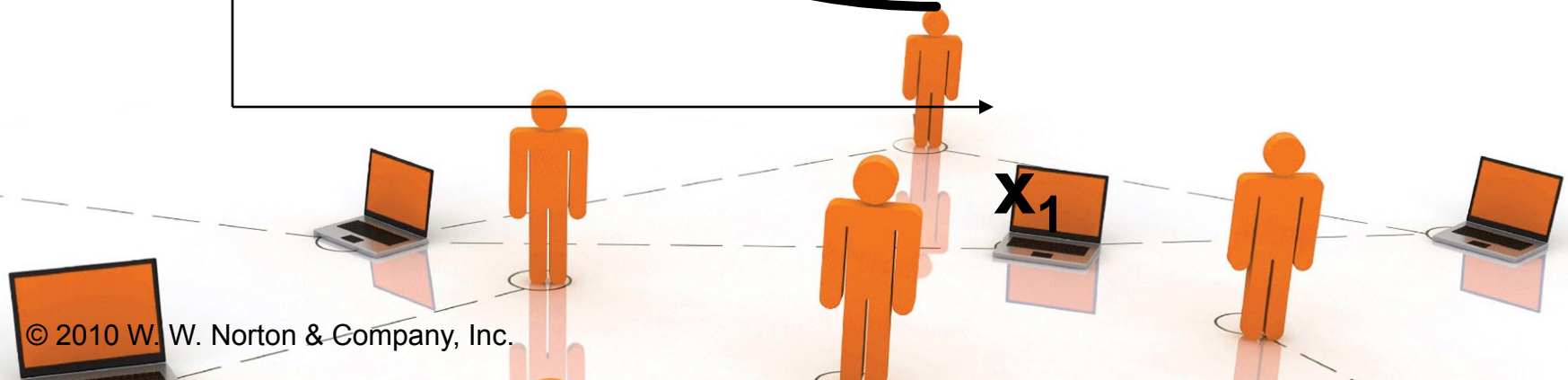
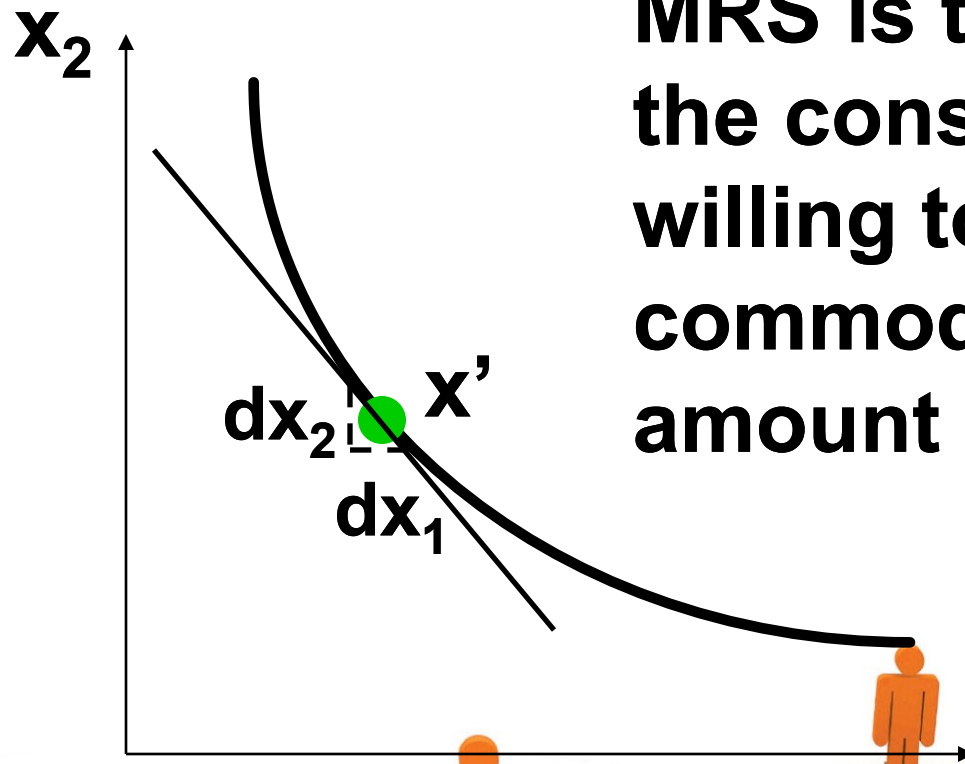


Marginal Rate of Substitution



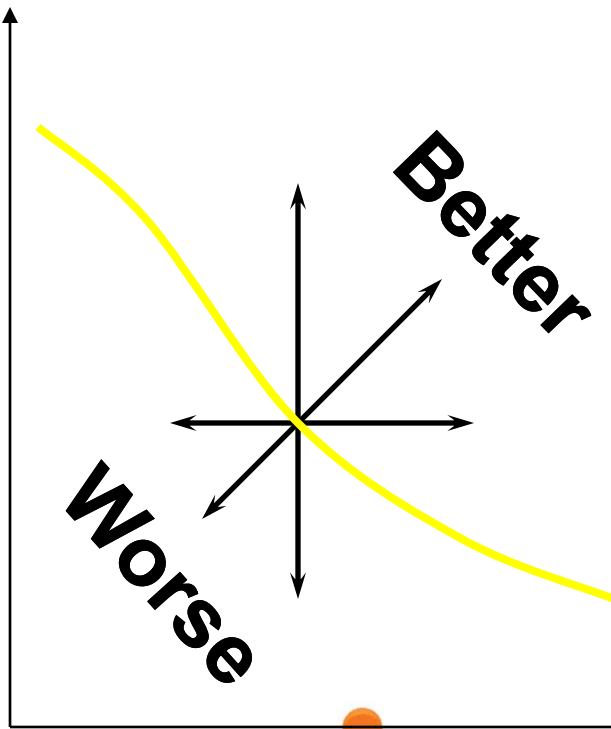
Marginal Rate of Substitution

$dx_2 = \text{MRS}' dx_1$ 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**

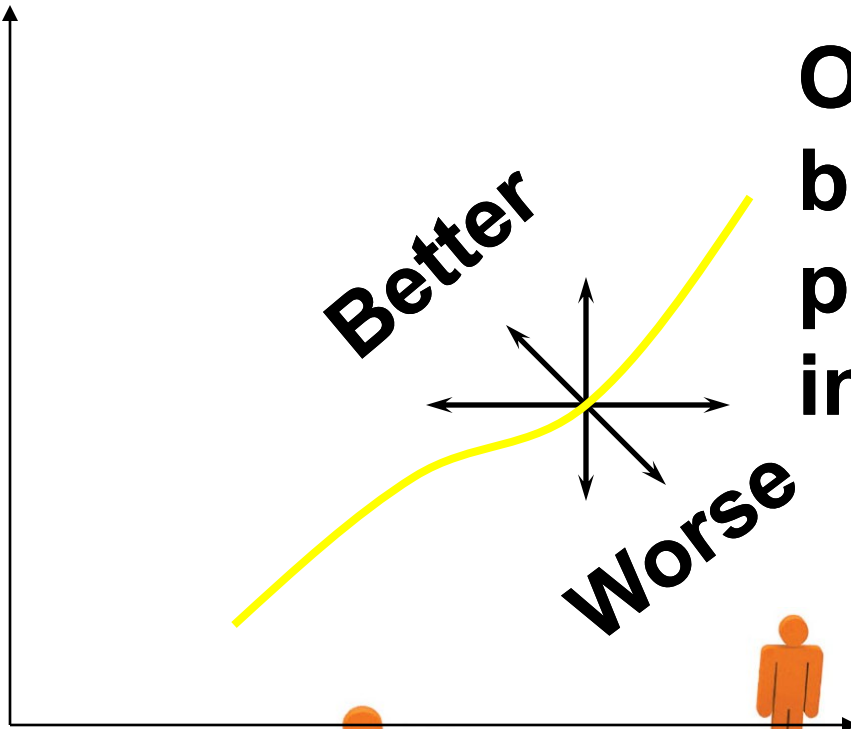
→ MRS < 0.

Good 1



MRS & Ind. Curve Properties

Good 2



One good and one bad → a positively sloped indifference curve

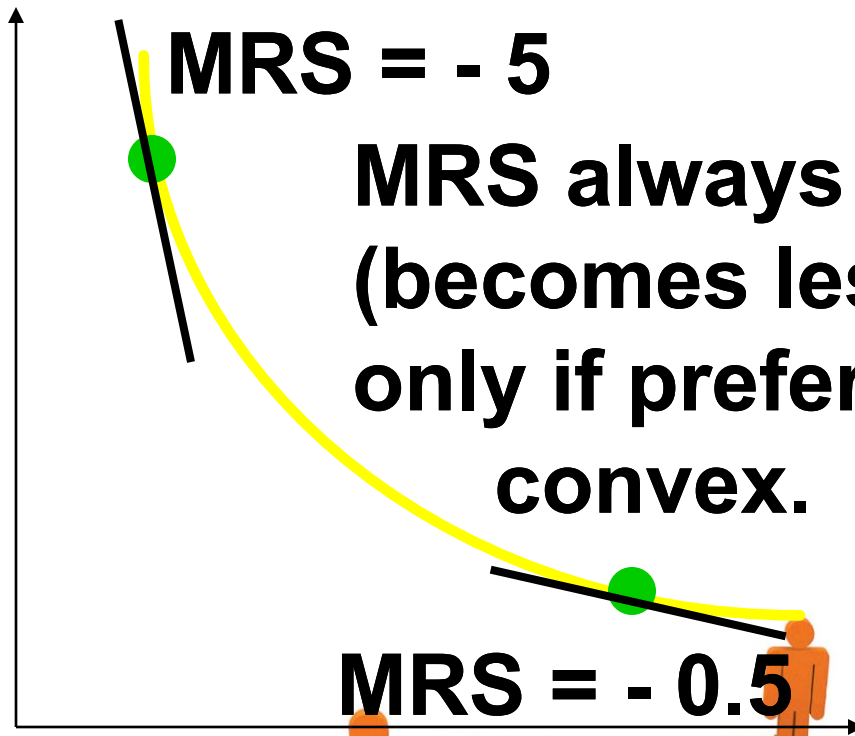
→ MRS > 0.

Bad 1



MRS & Ind. Curve Properties

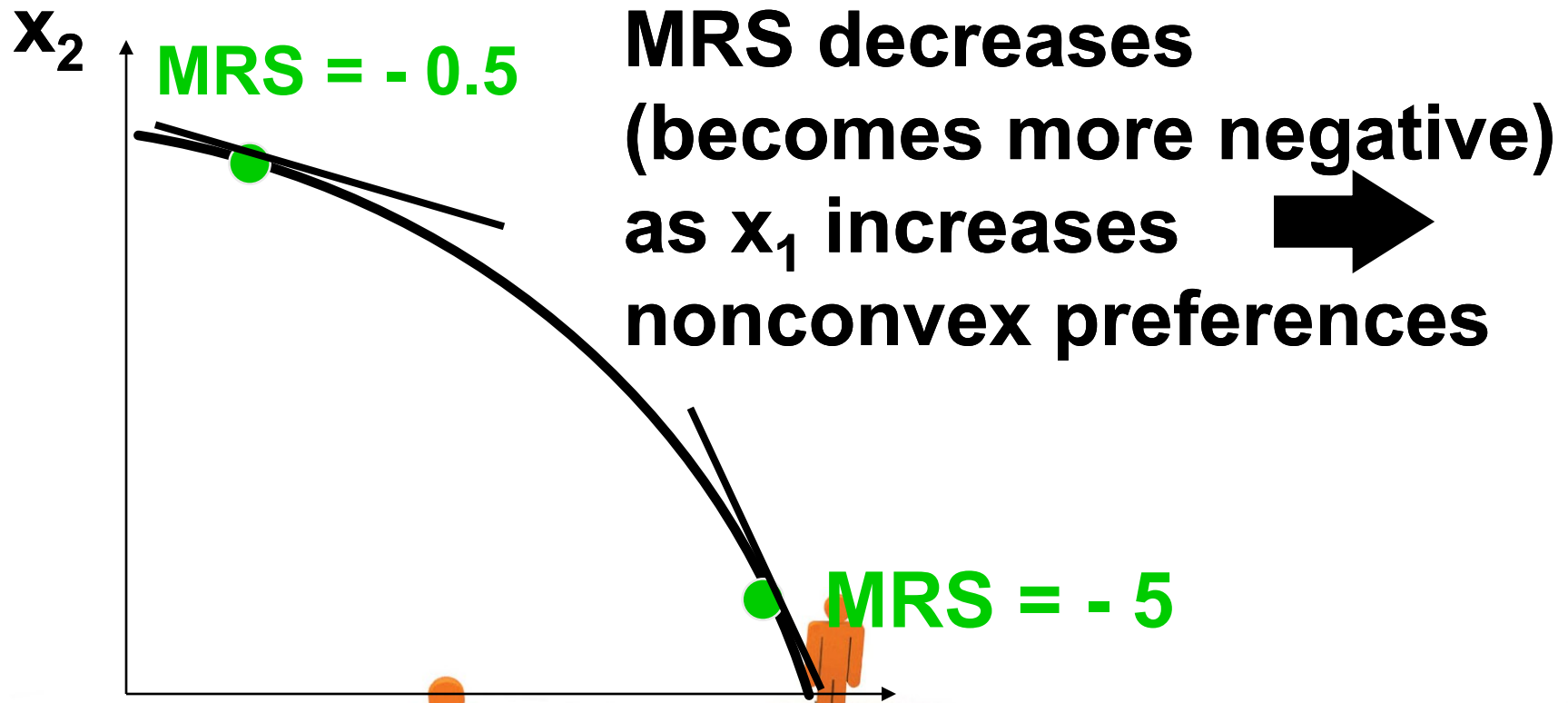
Good 2



Good 1



MRS & Ind. Curve Properties



MRS & Ind. Curve Properties

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

