Consumer Behavior

- There are 3 steps involved in studying consumer behavior.

1) **Consumer preferences**: describe how and why people prefer one good to another.

2) **Budget constraints**: people have limited incomes.

3) We will combine consumer preferences and budget constraints to determine **consumer choices**.
   - What combination of goods will consumers buy to maximize their satisfaction?

Consumer Preferences

Market Baskets

- A market basket is a collection of one or more commodities.
- One market basket may be preferred over another market basket containing a different combination of goods.
- Three Basic Assumptions

  1) Preferences are *complete* (comparison => A>B or A<B or A=B)

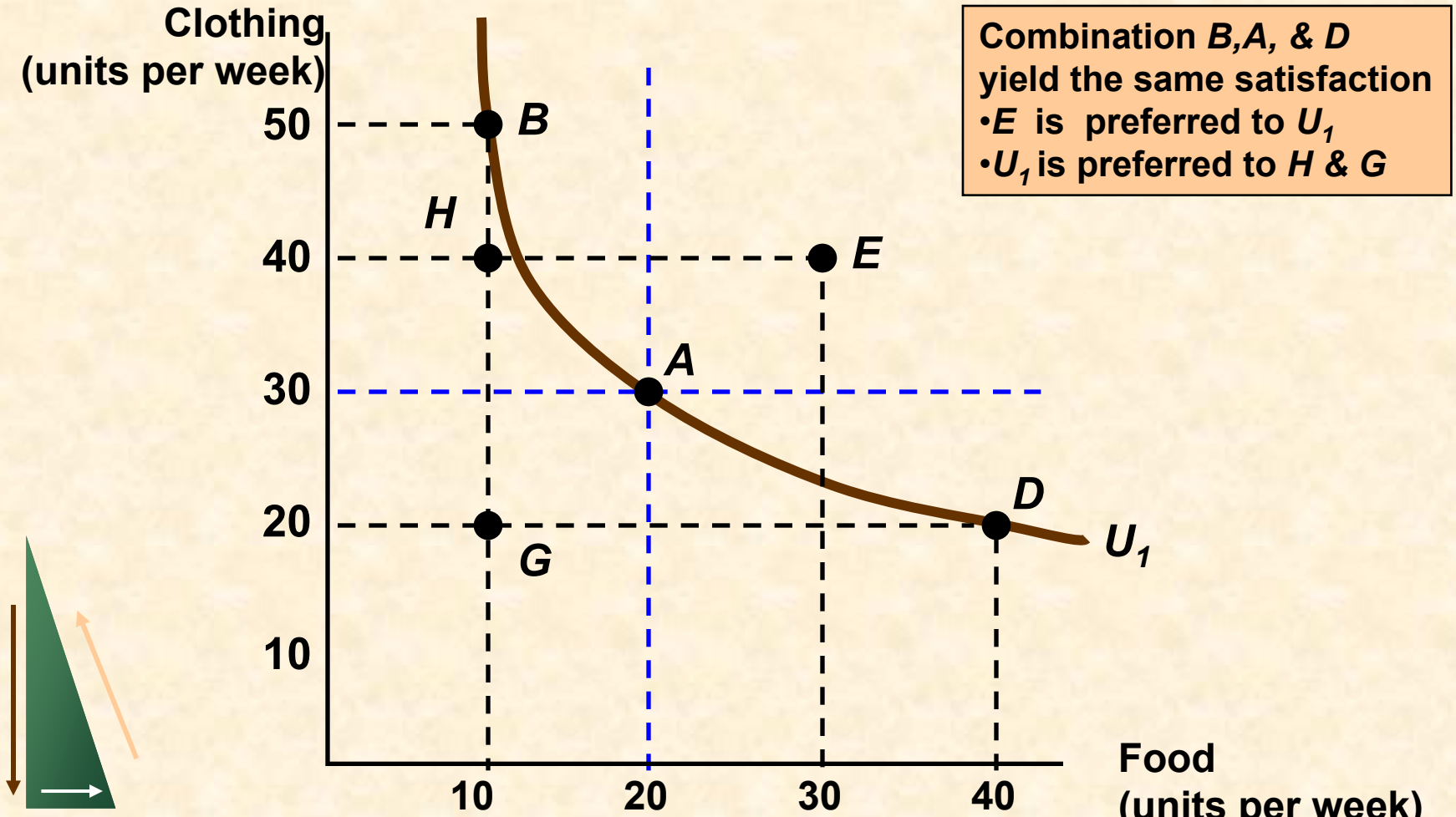
  2) Preferences are *transitive* (if A>B and B>C than A>C)

  3) Consumers always prefer more of a good to less.

Consumer Preferences

Market Basket	Units of Food	Units of Clothing
A	20	30
B	10	50
D	40	20
E	30	40
G	10	20
H	10	40

Consumer Preferences



Consumer Preferences

- Indifference curves represent all combinations of market baskets that provide the same level of satisfaction to a person.
- Indifference Curves slope downward to the right.
  - If they sloped upward it would violate the assumption that more of any commodity is preferred to less.

Consumer Preferences

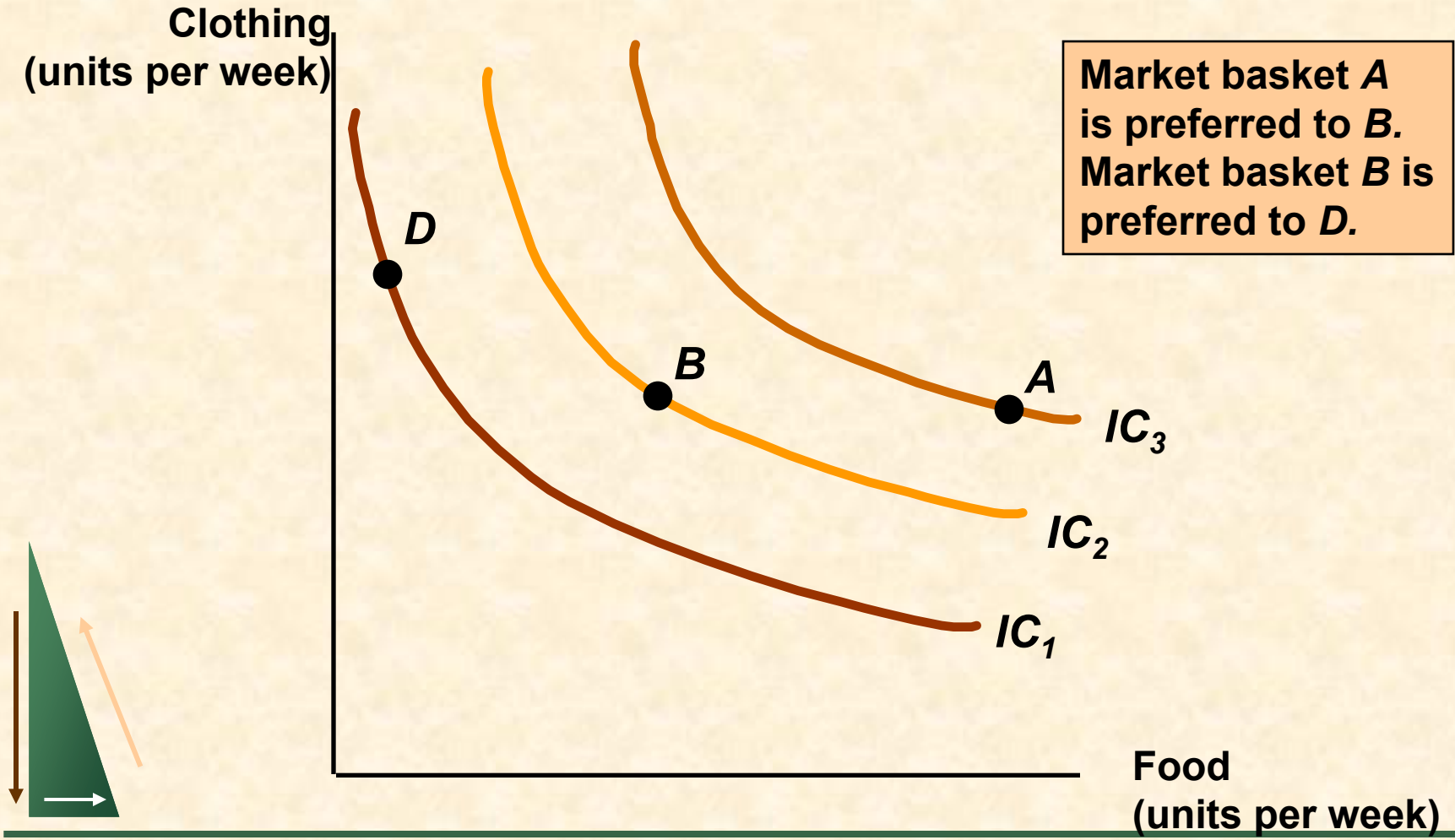
- Indifference Curves
  - Any market basket lying above and to the right of an indifference curve is preferred to any market basket that lies on the indifference curve.
- Indifference Curves
  - Indifference curves cannot cross as this would violate the assumption that more is preferred to less

Consumer Preferences

Indifference Maps

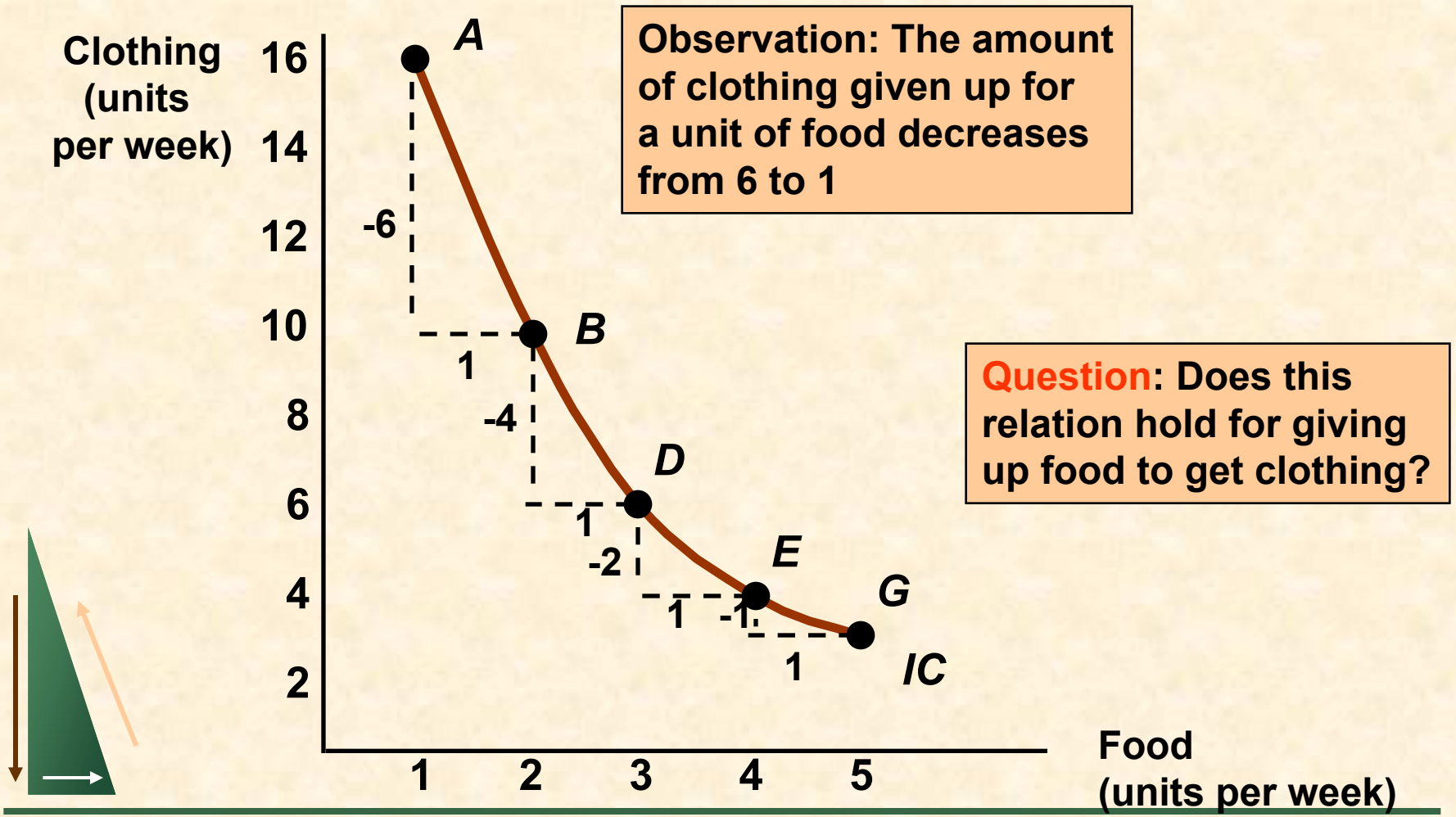
- An indifference map is a set of indifference curves that describes a person's preferences for all combinations of two commodities.
  - Each indifference curve in the map shows the market baskets among which the person is indifferent.

Consumer Preferences



Market basket *A* is preferred to *B*. Market basket *B* is preferred to *D*.

Consumer Preferences



Observation: The amount of clothing given up for a unit of food decreases from 6 to 1

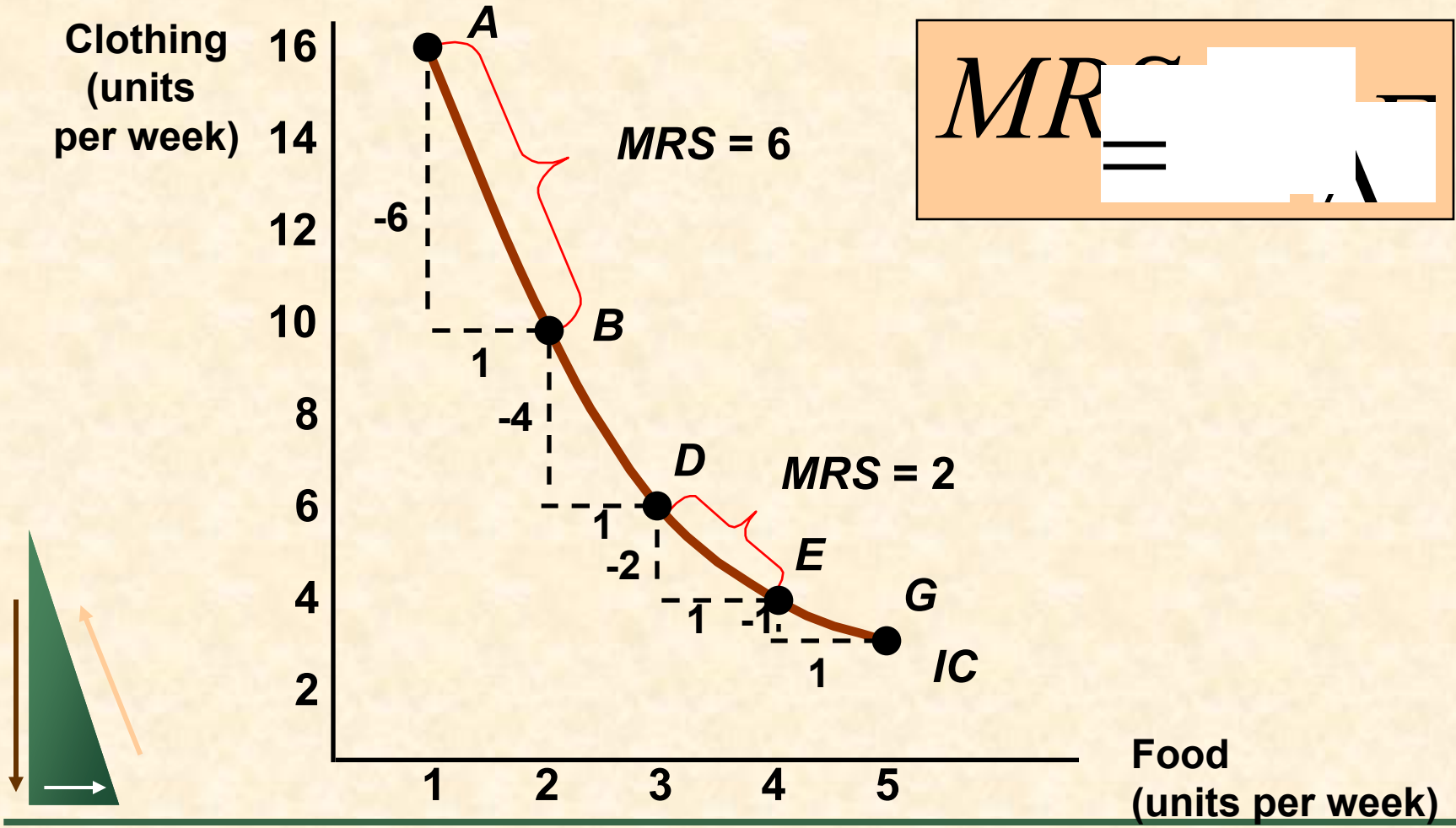
Question: Does this relation hold for giving up food to get clothing?

Consumer Preferences

Marginal Rate of Substitution

- The marginal rate of substitution (*MRS*) quantifies the amount of one good a consumer will give up to obtain more of another good.
  - It is measured by the slope of the indifference curve.
  - Along an indifference curve there is a *diminishing marginal rate of substitution.*

Consumer Preferences

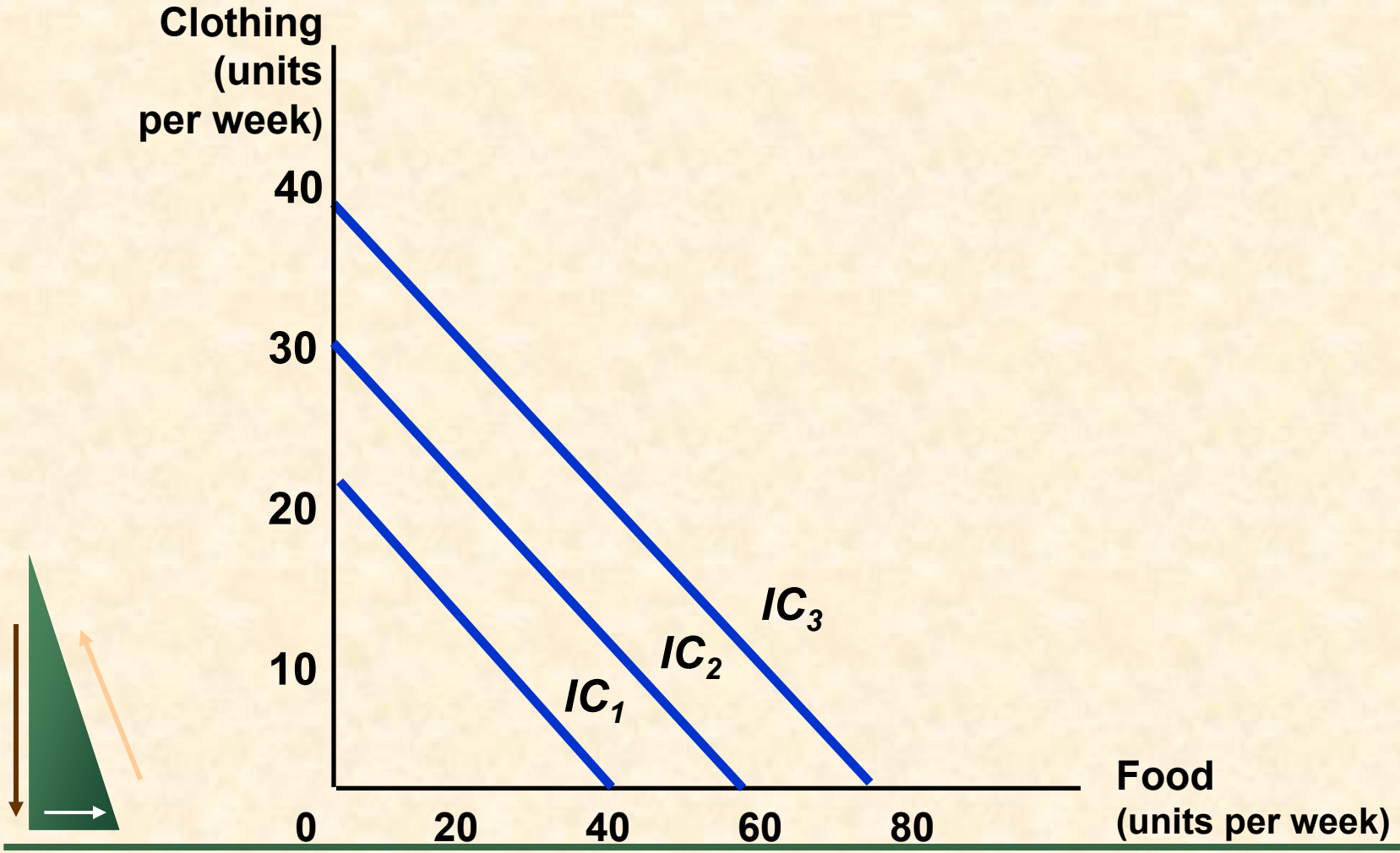


Consumer Preferences

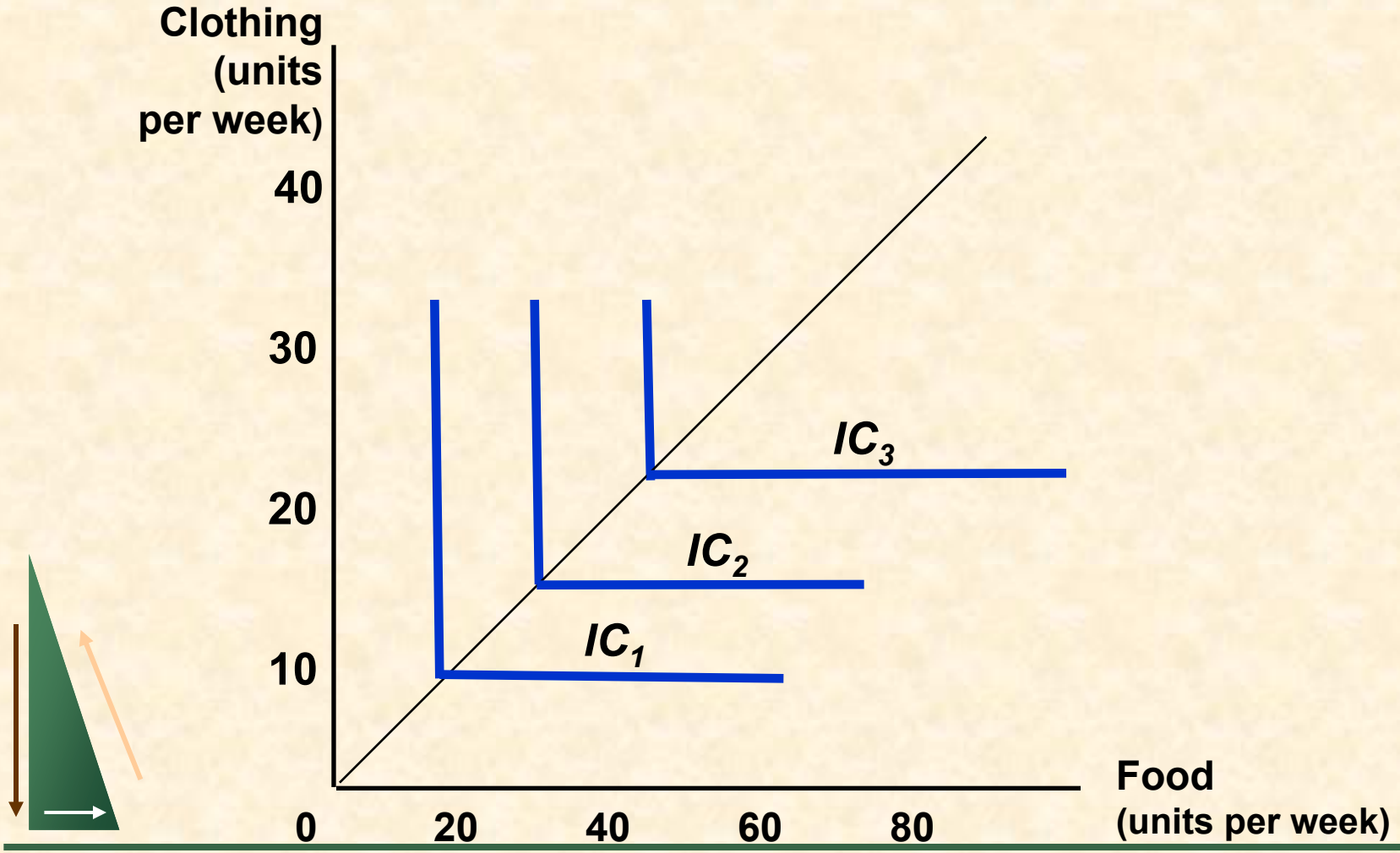
Marginal Rate of Substitution

- Perfect Substitutes and Perfect Complements
  - Two goods are perfect substitutes when the marginal rate of substitution of one good for the other is constant (not curve but straight line). Wine?
  - Two goods are perfect complements when the indifference curves for the goods are shaped as right angles. Shoes?

Perfect substitutes



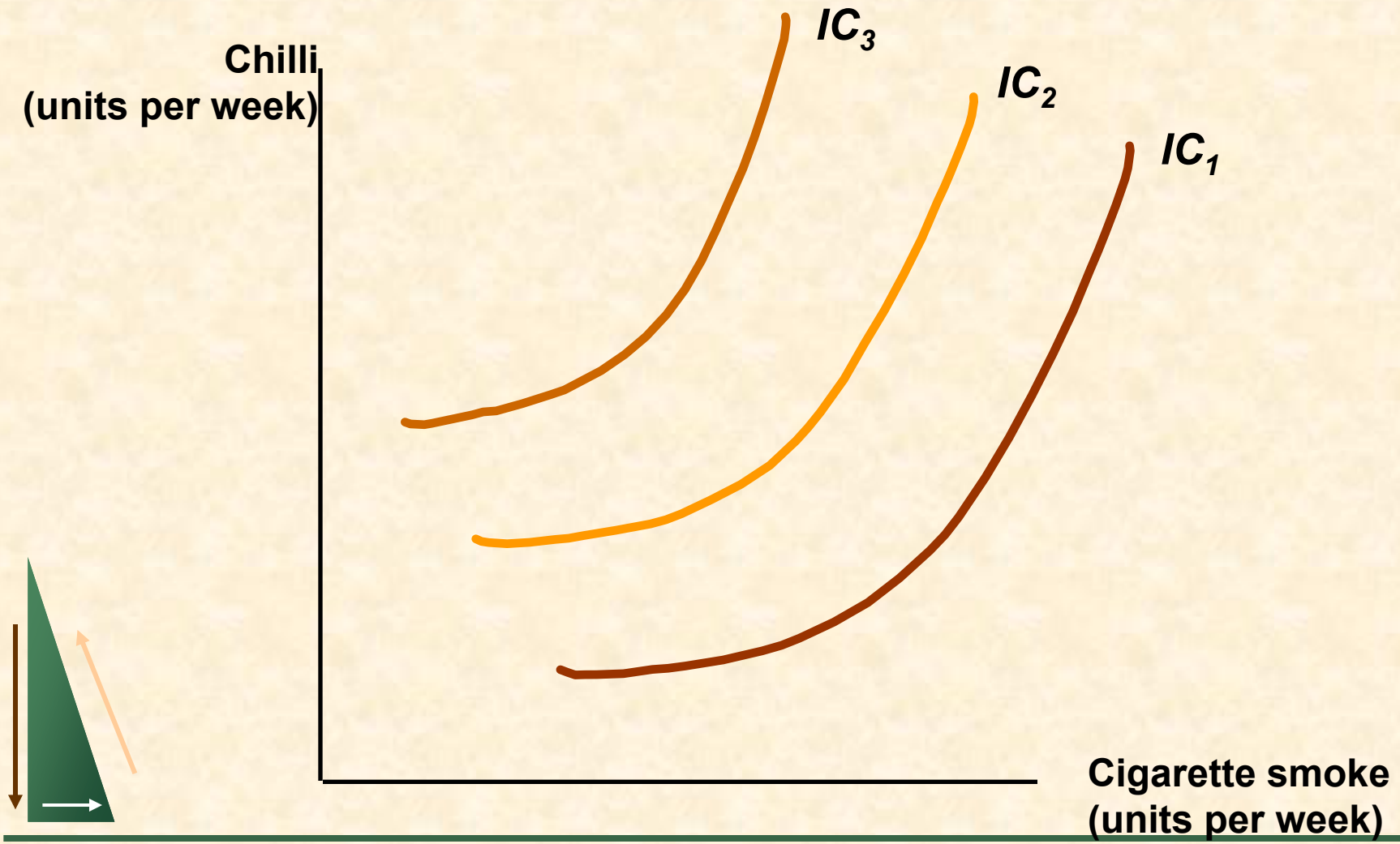
Perfect complements



Consumer Preferences

- BADS
  - Things for which less is preferred to more
- Examples
  - Air pollution
  - Asbestos
- **What Do You Think?**
  - How can we account for Bads in the analysis of consumer preferences?

Consumer Preferences



Consumer Preferences

Application: Designing New Automobiles

- Car executives must regularly decide when to introduce new models and how much money to invest in restyling.
- An analysis of consumer preferences would help to determine when and if car companies should change the styling of their cars.
- **What Do You Think?** How can we determine the consumers' preferences?

Consumer Preferences

- Utility
  - Utility: Numerical score representing the satisfaction that a consumer gets from a given market basket.
- If buying 3 copies of *Microeconomics* makes you happier than buying one shirt, then we say that the books give you more utility than the shirt.

Consumer Preferences

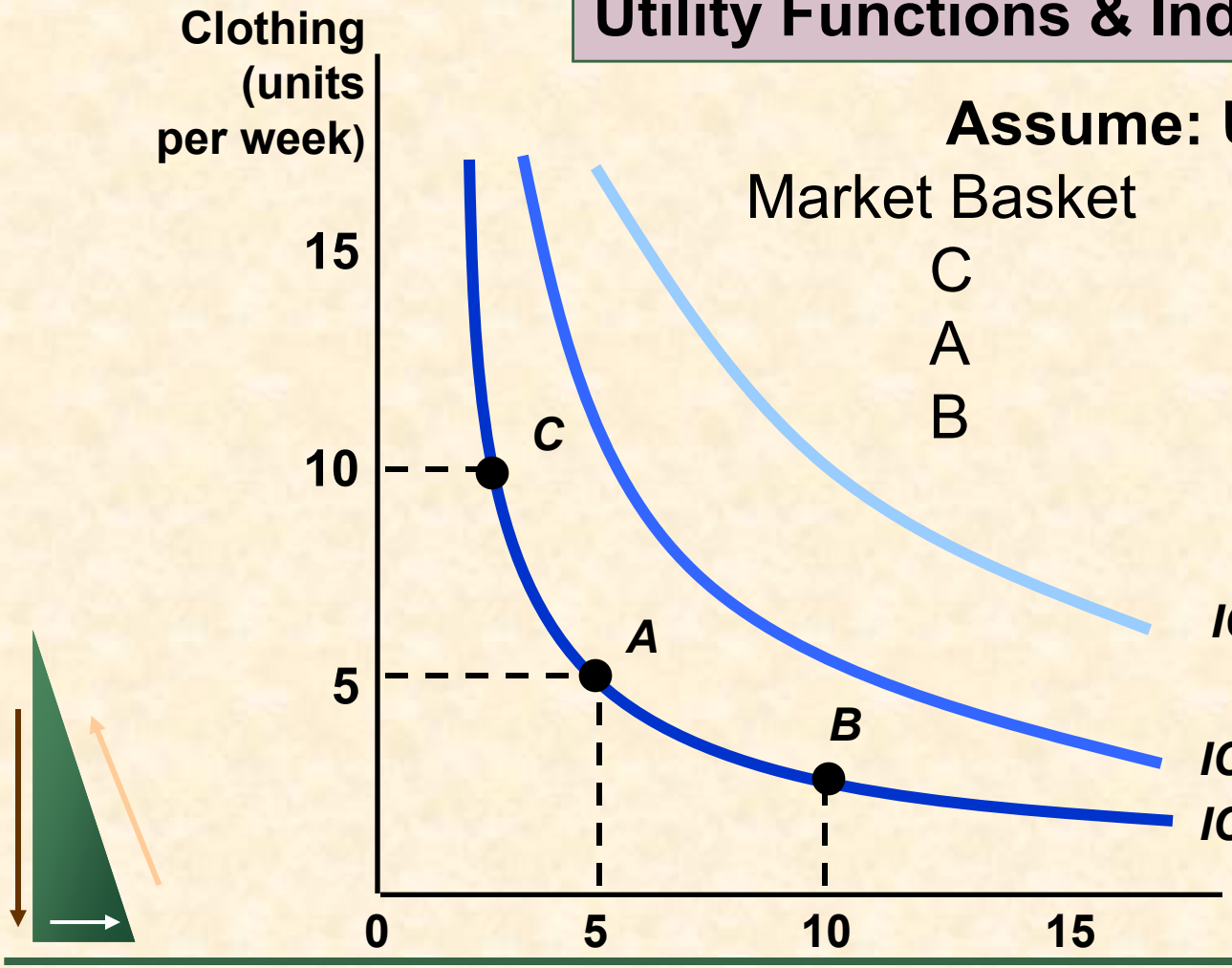
- Utility Functions
  - Assume:
    The utility function for food (F) and clothing (C)
    $$U(F,C) = F + 2C$$

Market Baskets:	F units	C units	U(F,C) = F + 2C
A	8	3	8 + 2x3 = 14
B	6	4	6 + 2x4 = 14
C	4	4	4 + 2x4 = 12

The consumer is indifferent to A & B
The consumer prefers A & B to C

Consumer Preferences

Utility Functions & Indifference Curves



Assume: U = FC

Market Basket	U = FC
C	25 = 2.5(10)
A	25 = 5(5)
B	25 = 10(2.5)

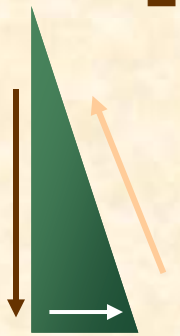
IC_3 = 100 (Preferred to IC_2)

IC_2 = 50 (Preferred to IC_1)

IC_1 = 25

Consumer Preferences

- Ordinal Versus Cardinal Utility
  - Ordinal Utility Function: places market baskets from most preferred to least preferred, but does not indicate how much one market basket is preferred to another.
  - Cardinal Utility Function: describes the extent to which one market basket is preferred to another (we can measure utility)
- Ordinal Versus Cardinal Rankings
  - The actual unit of measurement for utility is not important. Therefore, an ordinal ranking is sufficient to explain how most individual decisions are made.

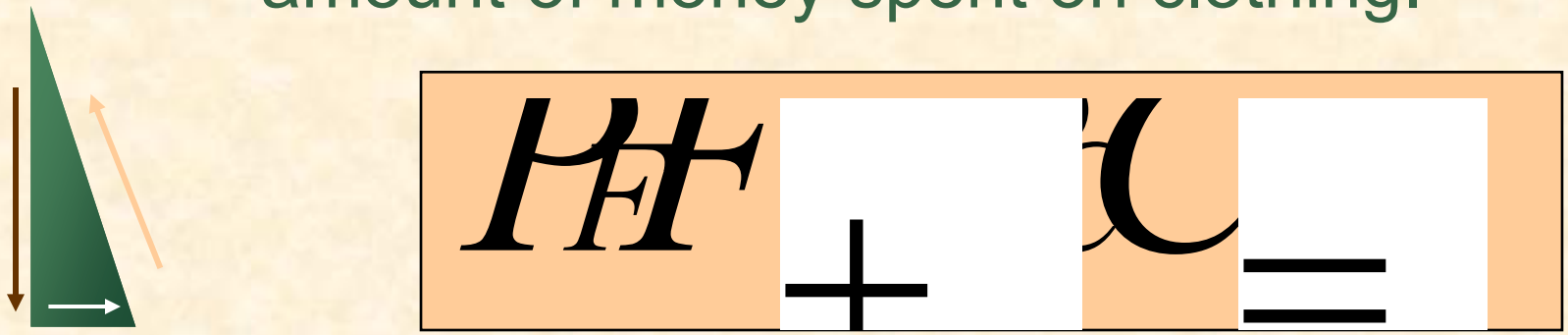


Budget Constraints

- Preferences do not explain all of consumer behavior.
- Budget constraints also limit an individual's ability to consume in light of the prices they must pay for various goods and services.
- The Budget Line: indicates all combinations of two commodities for which total money spent equals total income.

Budget Constraints

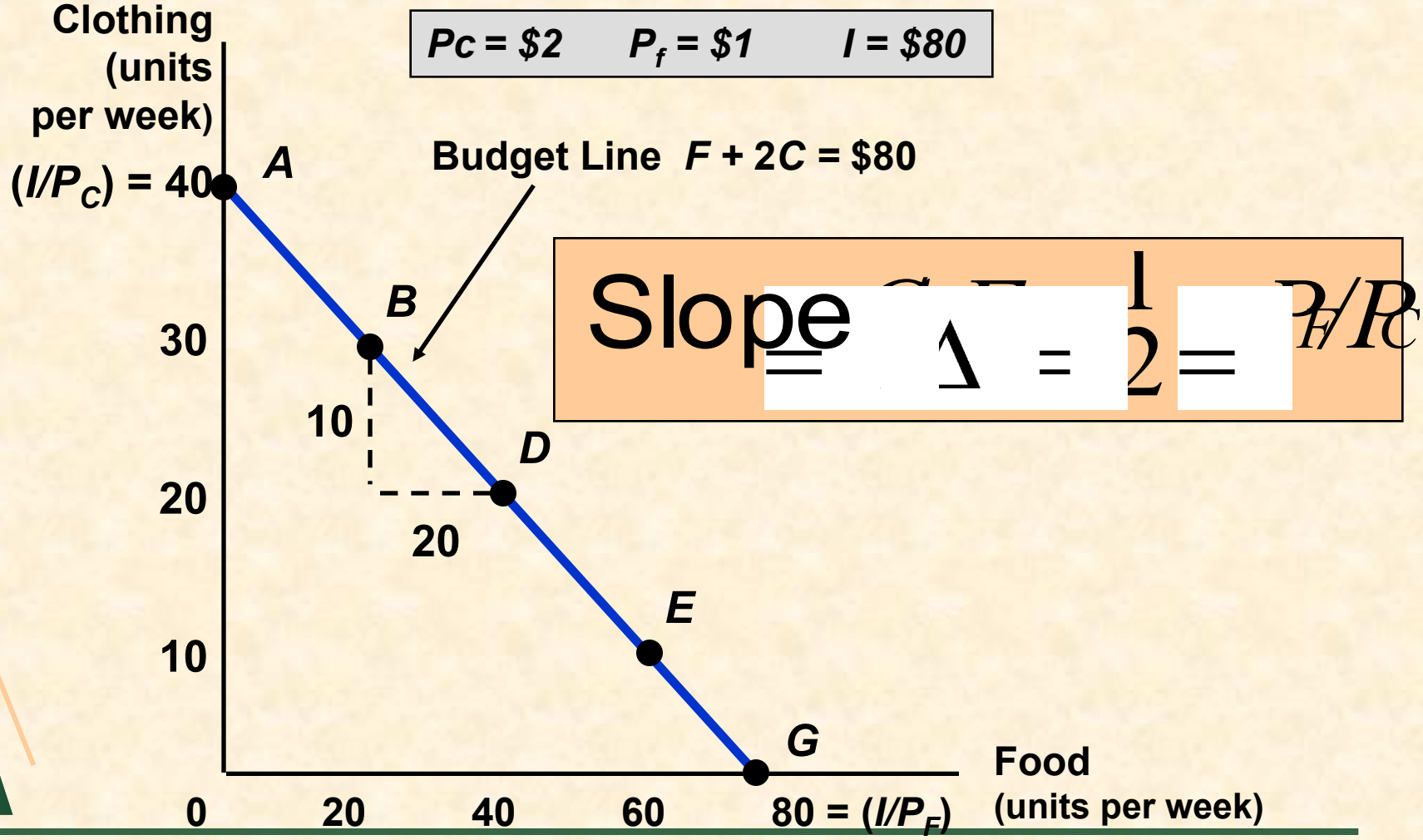
- The Budget Line
  - Let F equal the amount of food purchased, and C is the amount of clothing.
  - If the price of food = P_f and price of clothing = P_c, then $P_f F$ is the amount of money spent on food, and $P_c C$ is the amount of money spent on clothing.



Budget Constraints

Market Basket	Food (F) P_f = ($1)	Clothing (C) P_c = ($2)	Total Spending $P_fF + P_cC = I$
A	0	40	$80
B	20	30	$80
D	40	20	$80
E	60	10	$80
G	80	0	$80

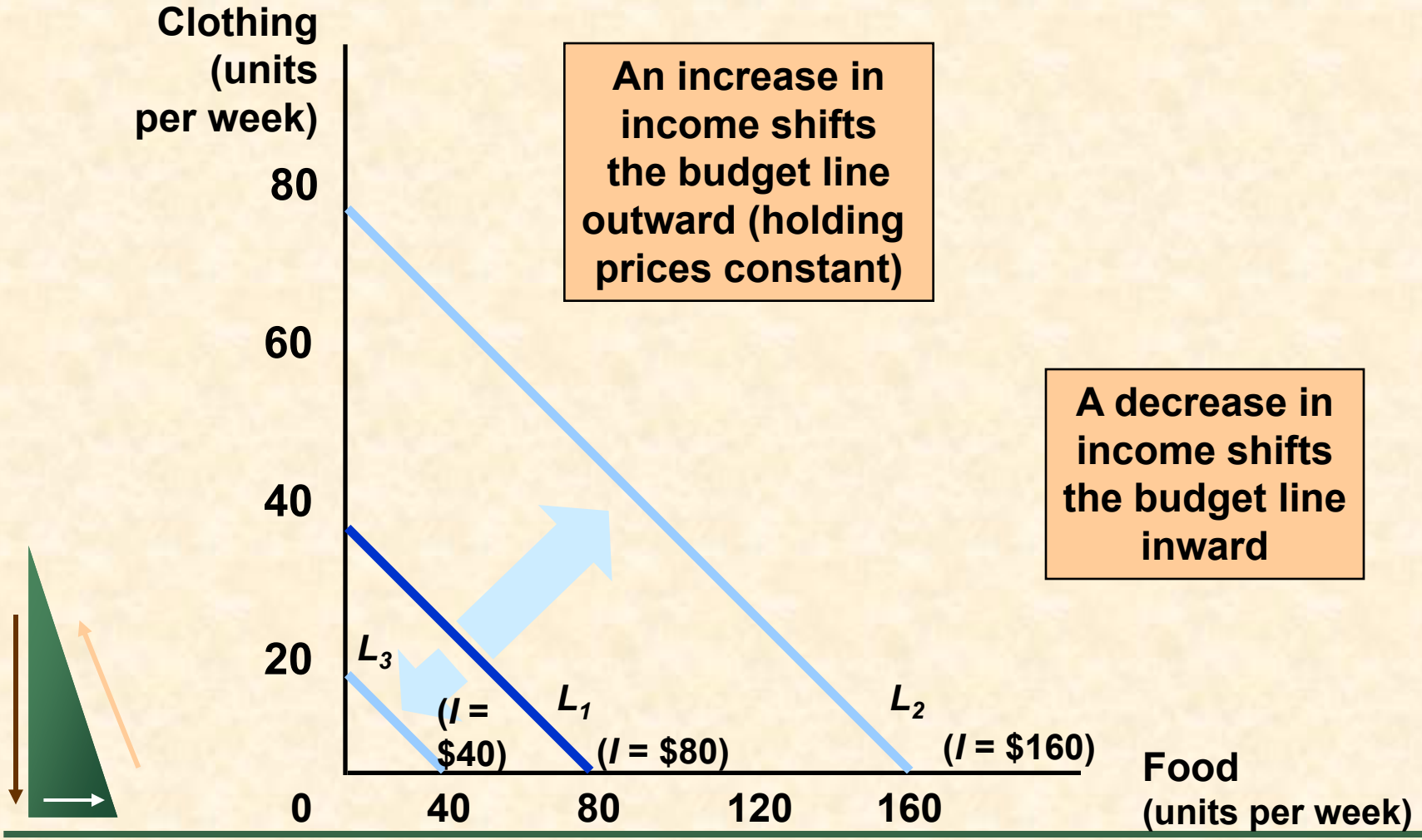
Budget Constraints



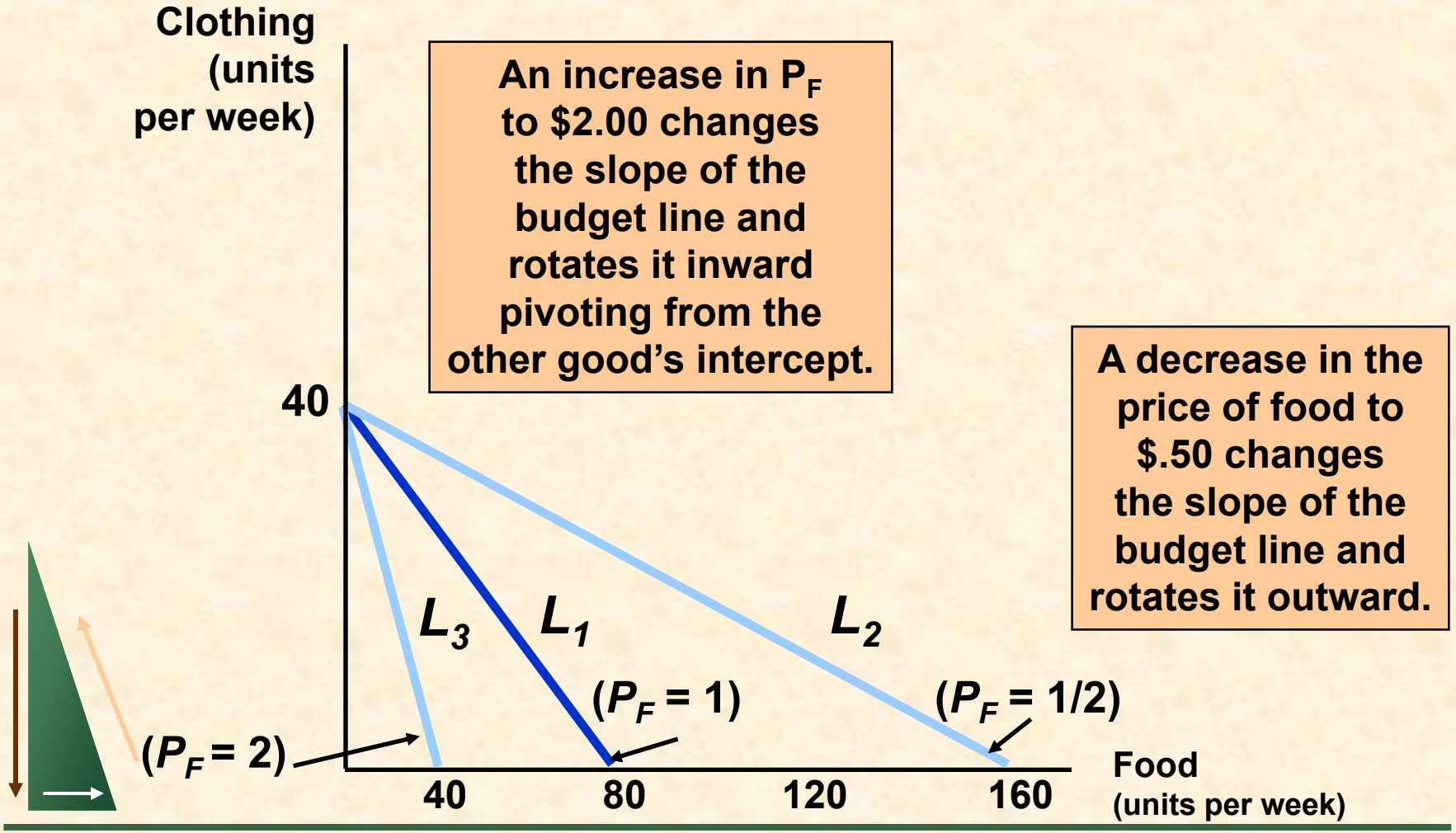
Budget Constraints

- The Budget Line
  - As consumption moves along a budget line from the intercept, the consumer spends less on one item and more on the other.
  - The slope of the line measures the relative cost of food and clothing = the negative of the ratio of the prices of the two goods.
  - The slope indicates the rate at which the two goods can be substituted without changing the amount of money spent.

Budget Constraints: Changes in Income and Prices



Budget Constraints: Changes in Income and Prices



Budget Constraints

- *The Effects of Changes in Income and Prices*
  - **Price Changes 1**: If the two goods increase in price, but the *ratio* of the two prices is unchanged, the slope will not change. However, the budget line will shift inward to a point parallel to the original budget line.
  - **Price Changes 2**: If the two goods decrease in price, but the *ratio* of the two prices is unchanged, the slope will not change. However, the budget line will shift outward to a point parallel to the original budget line.

Consumer Choice

- Consumers choose a combination of goods that maximizes their satisfaction, given the limited budget available to them.
- The maximizing market basket must satisfy two conditions:

  1) It must be located on the budget line.

  2) It must give the consumer the most preferred combination of goods and services.

Consumer Choice

Recall, the slope of an indifference curve is:

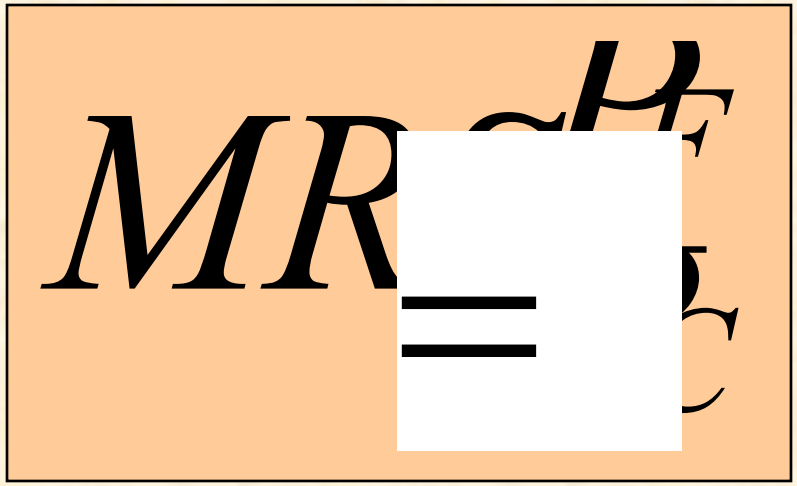
$$MRS = \frac{\Delta}{\Delta}$$

Further, the slope of the budget line is:

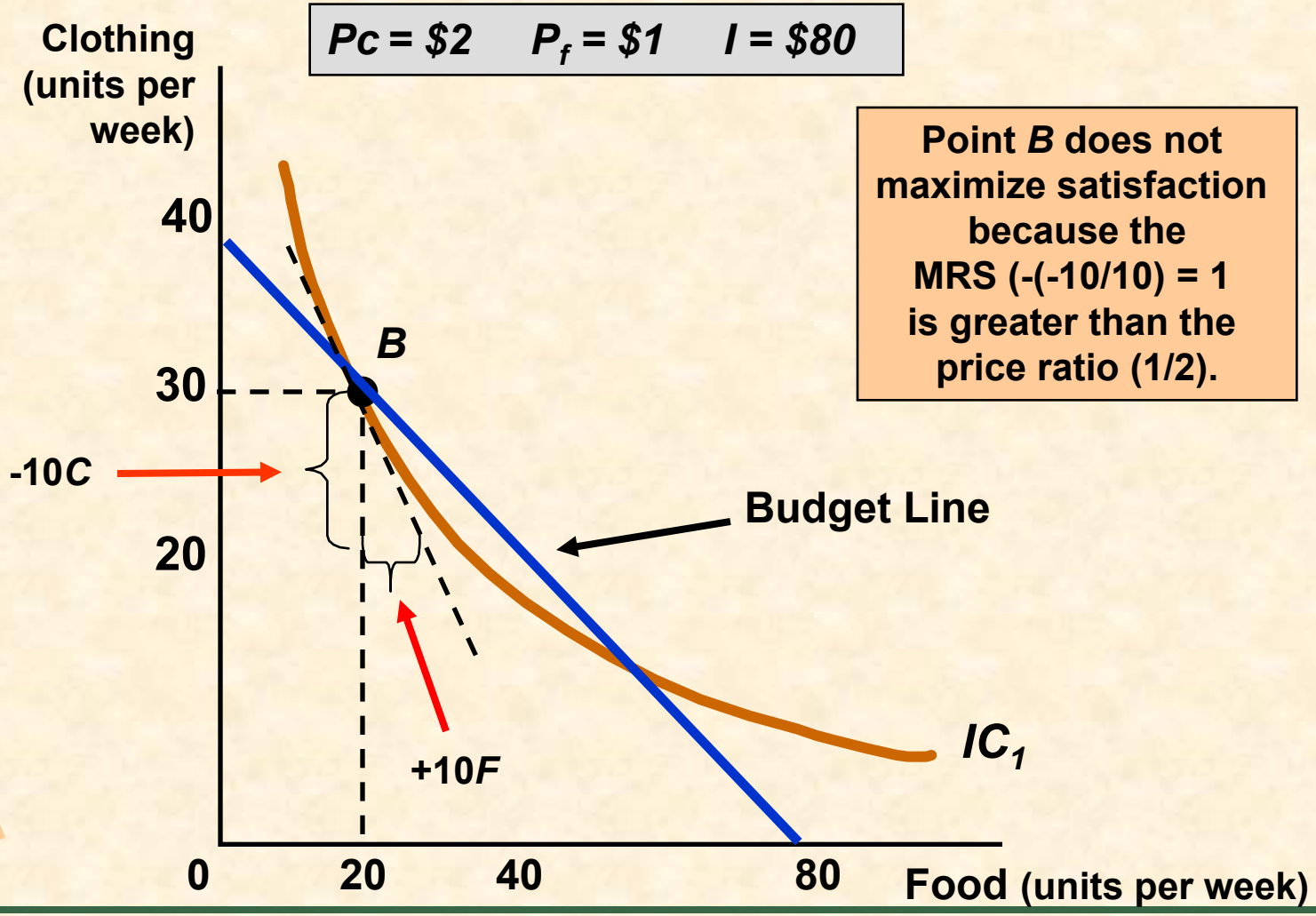
$$Slope = \frac{P_F}{P_C}$$

Consumer Choice

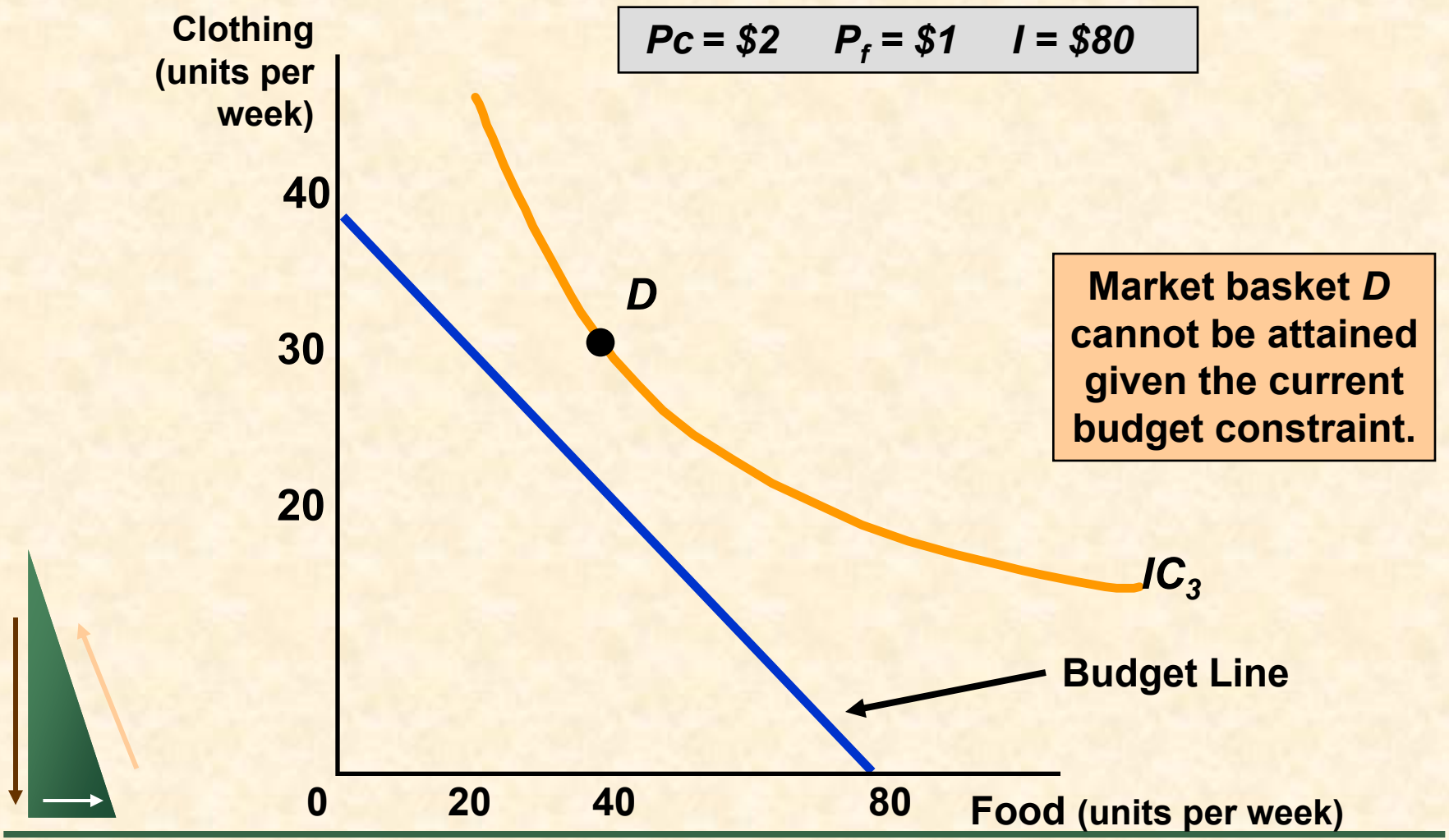
- Therefore, it can be said that satisfaction is maximized where:



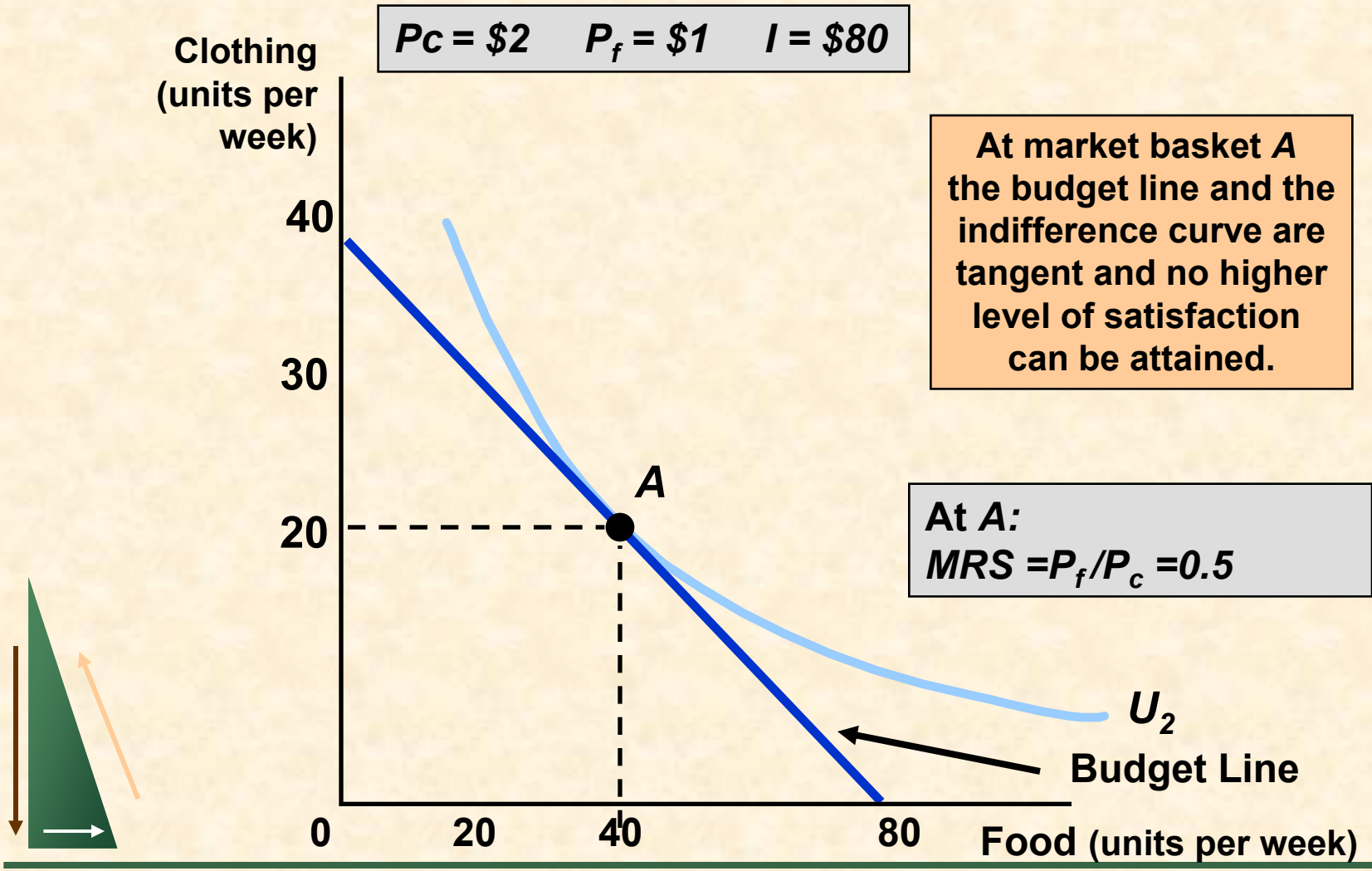
Consumer Choice



Consumer Choice



Consumer Choice



Consumer Choice

Application: Designing New Automobiles

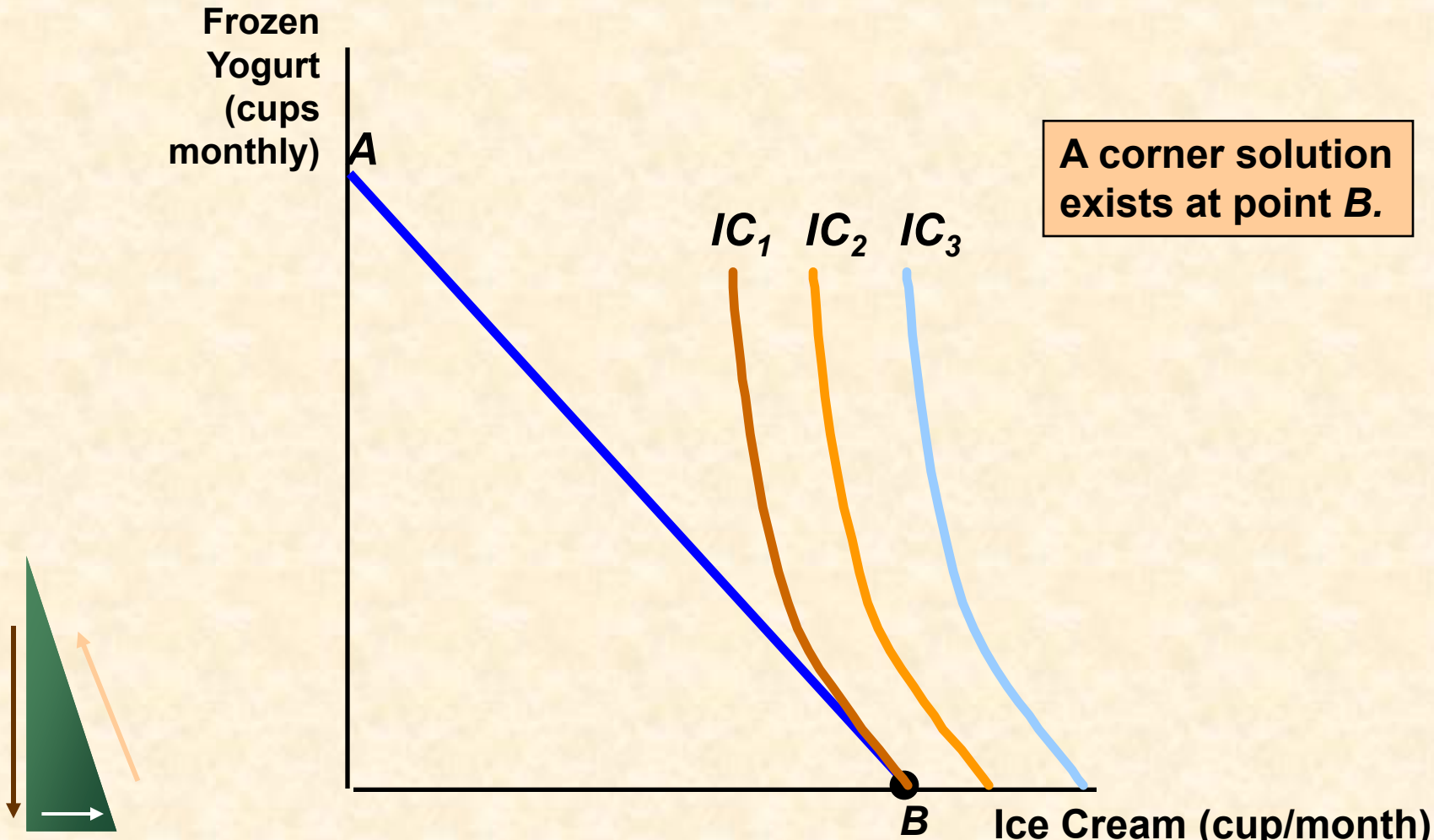
- Consider two groups of consumers, each wishing to spend $10,000 on the styling and performance of cars.
- Each group has different preferences.
- By finding the point of tangency between a group's indifference curve and the budget constraint auto companies can design a production and marketing plan.

Consumer Choice

A Corner Solution

- A corner solution exists if a consumer buys in extremes, and buys all of one category of good and none of another.
  - This exists where the indifference curves are tangent to the horizontal and/or vertical axis.
  - *MRS* is *not* equal to P_A/P_B at the chosen bundle.

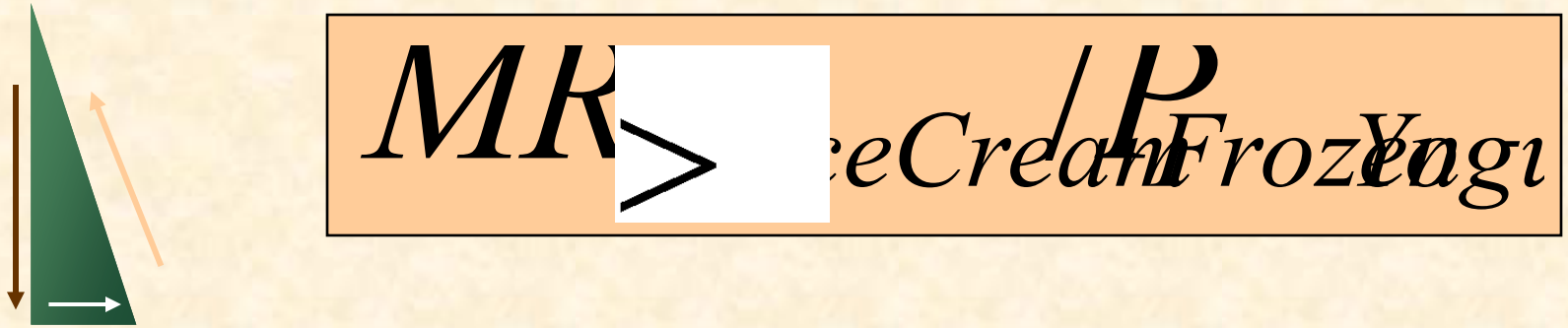
A Corner Solution



A corner solution exists at point *B*.

Consumer Choice

- A Corner Solution
  - When a corner solution arises, *the consumer's MRS does not necessarily equal the price ratio.*
- In this instance it can be said that:



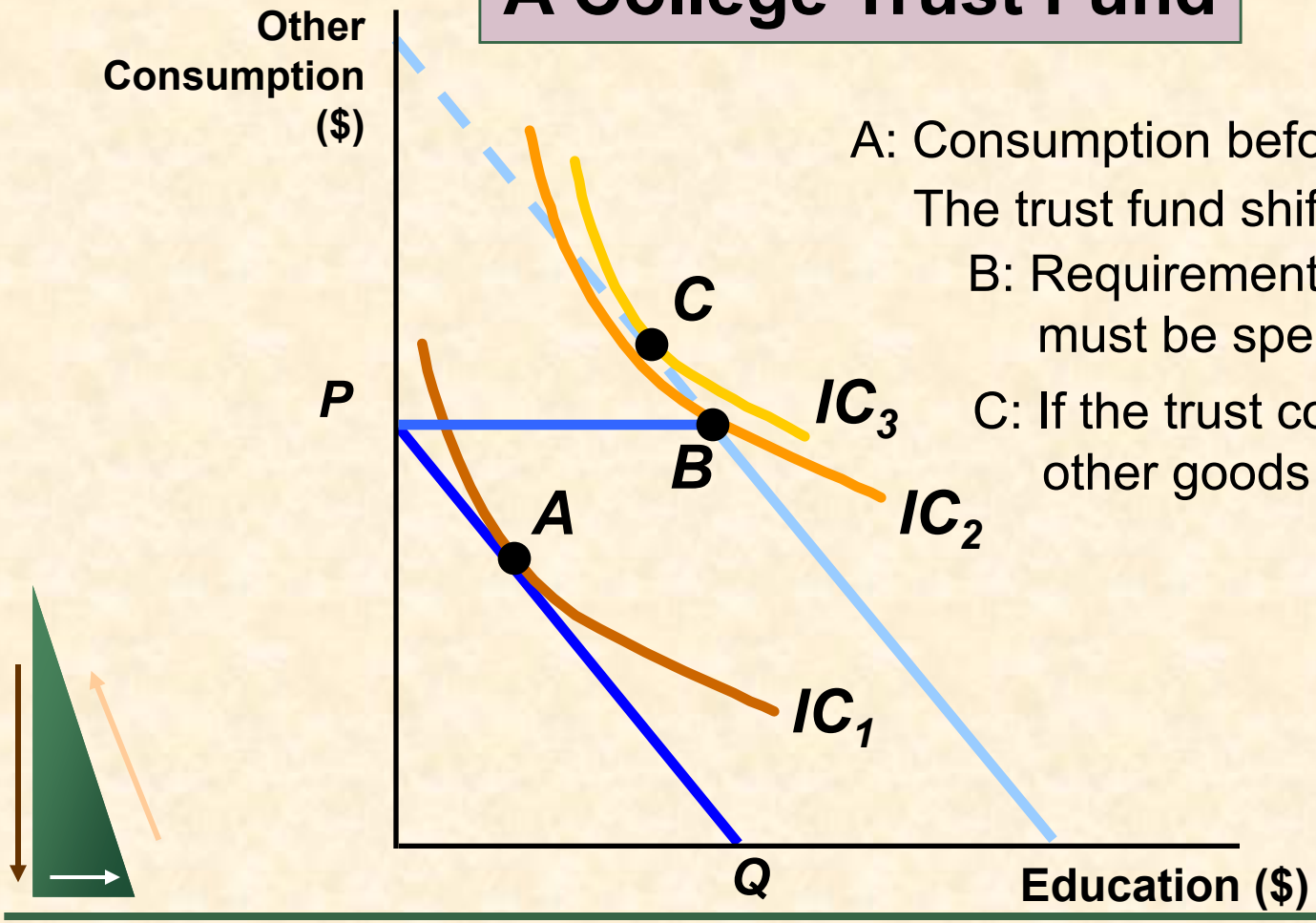
Consumer Choice

A College Trust Fund

- Suppose Jane Doe's parents set up a trust fund for her college education.
- Originally, the money must be used for education.
- If part of the money could be used for the purchase of other goods, her preferred consumption bundle changes.

Consumer Choice

A College Trust Fund



A: Consumption before the trust fund

The trust fund shifts the budget line

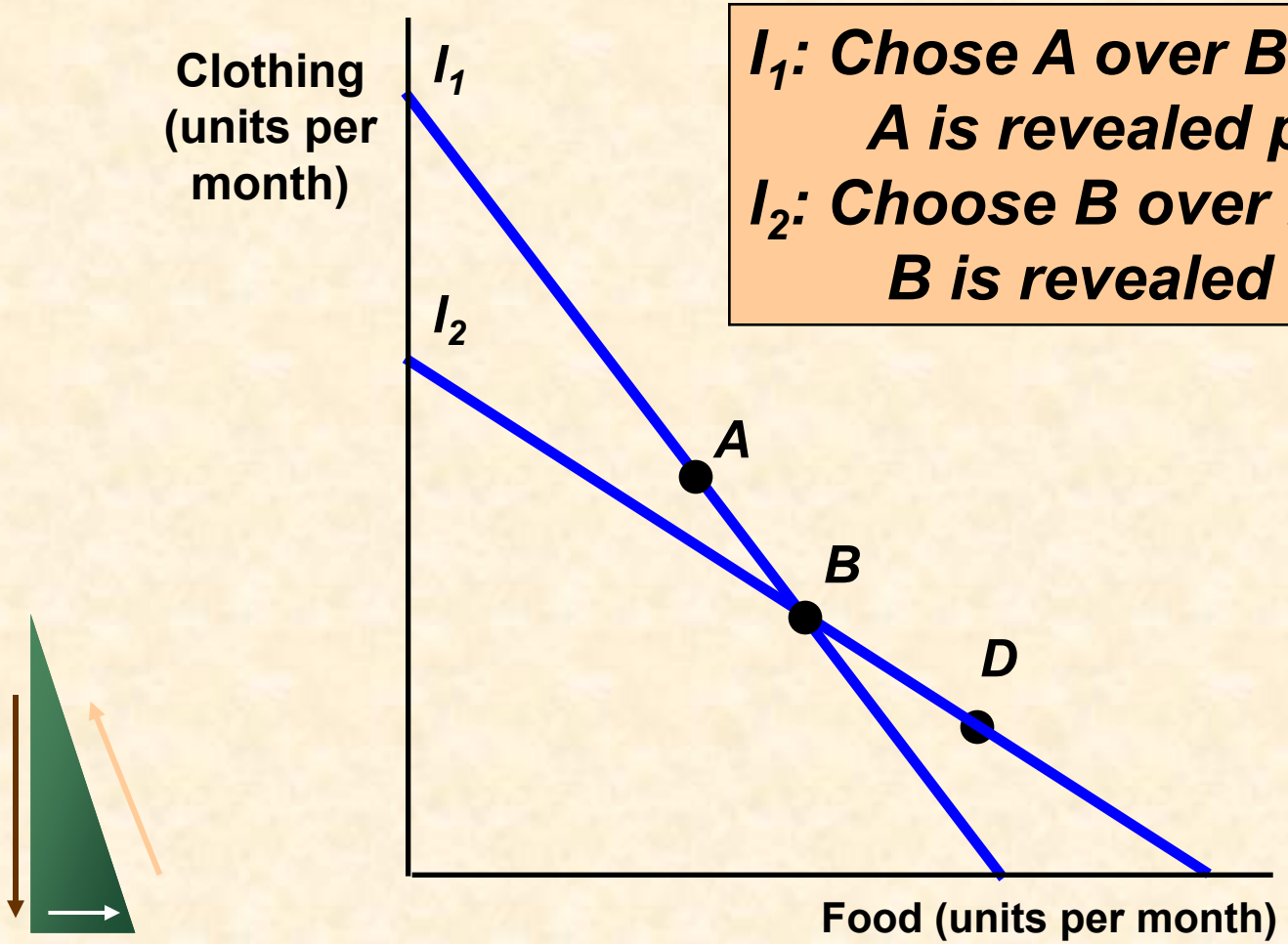
B: Requirement that the trust fund must be spent on education

C: If the trust could be spent on other goods

Revealed Preferences

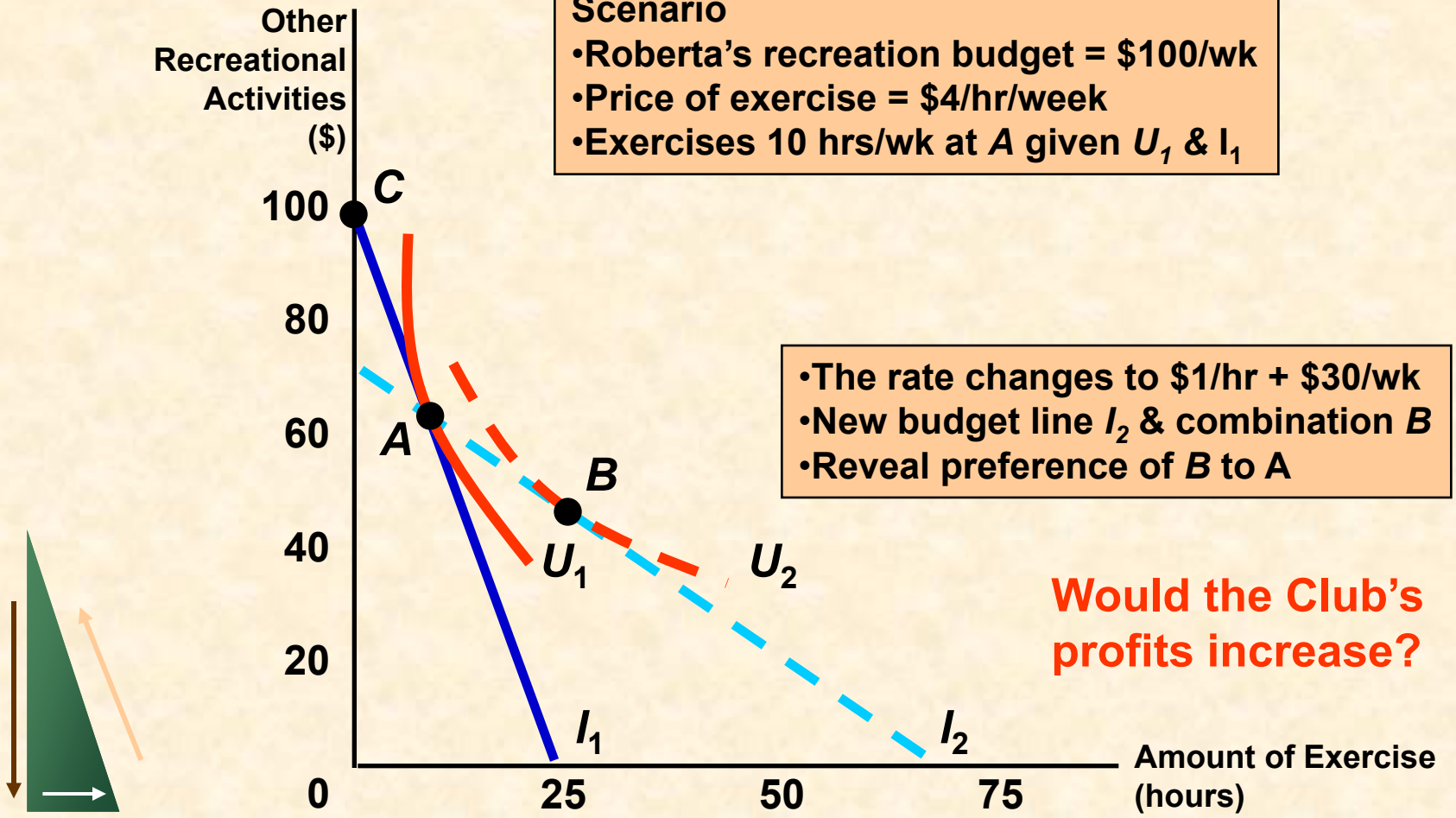
- If we know the choices a consumer has made, we can determine what her preferences are if we have information about a sufficient number of choices that are made when prices and income vary.

Revealed Preferences – 2 Budget Lines



I_1: Chose A over B
A is revealed preferred to B
I_2: Choose B over D
B is revealed preferred to D

Revealed Preferences for Recreation



Scenario
- Roberta's recreation budget = $100/wk
- Price of exercise = $4/hr/week
- Exercises 10 hrs/wk at *A* given U_1 & I_1

- The rate changes to $1/hr + $30/wk
- New budget line I_2 & combination *B*
- Reveal preference of *B* to A

Would the Club's profits increase?

Marginal Utility and Consumer Choice

Marginal Utility

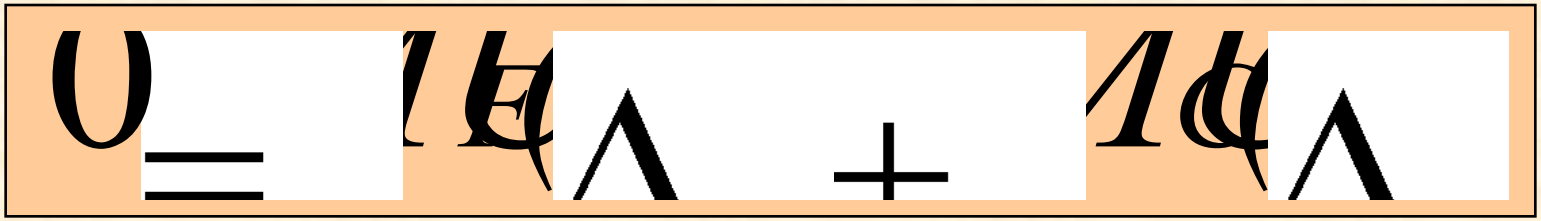
- Marginal utility = the additional satisfaction obtained from consuming one additional unit of a good.
- Example
  - The marginal utility derived from increasing from 0 to 1 units of food might be 9
  - Increasing from 1 to 2 might be 7
  - Increasing from 2 to 3 might be 5
- Observation: Marginal utility is diminishing: as more and more of a good is consumed, consuming additional amounts will yield smaller and smaller additions to total utility.

Marginal Utility and Consumer Choice

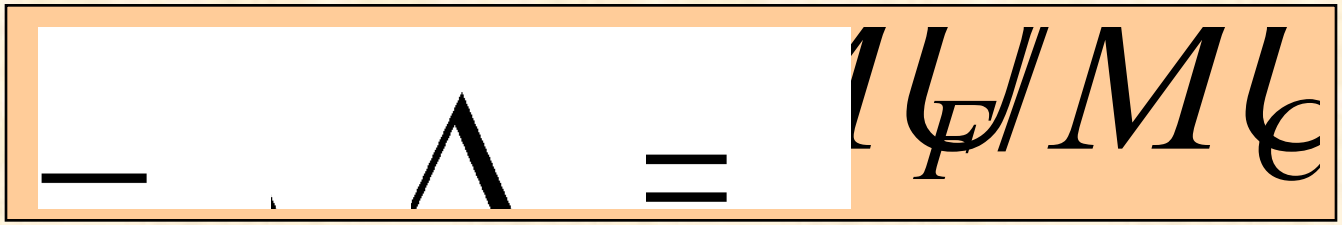
- Marginal Utility and the Indifference Curve
  - If consumption moves along an indifference curve, the additional utility derived from an increase in the consumption one good, food (F), must balance the loss of utility from the decrease in the consumption in the other good, clothing (C).

Marginal Utility and Consumer Choice

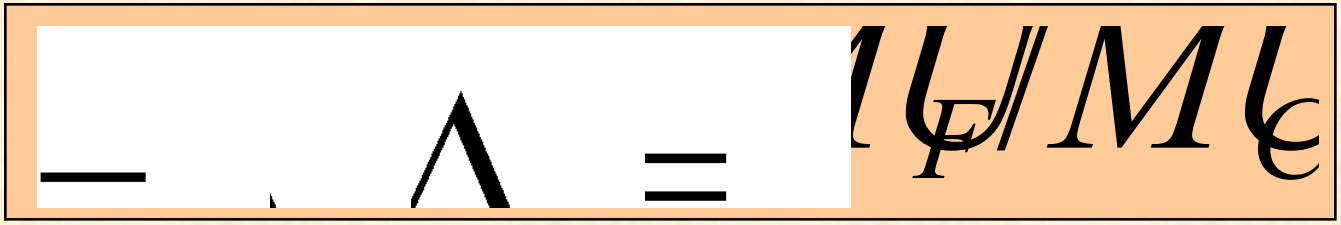
- Formally:



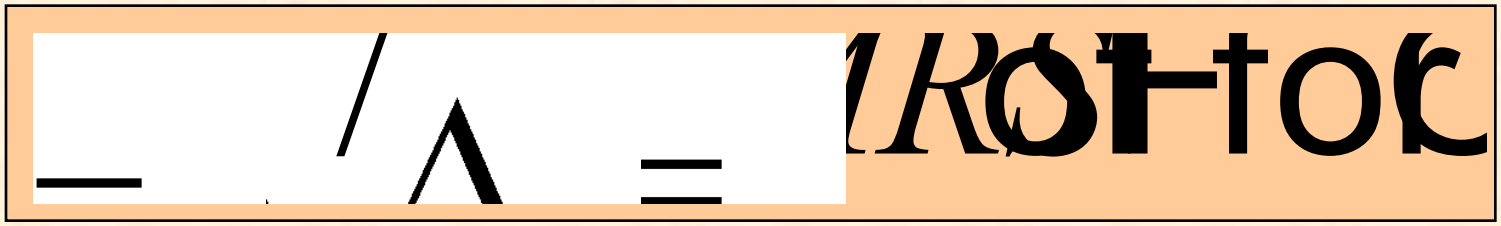
- Rearranging:

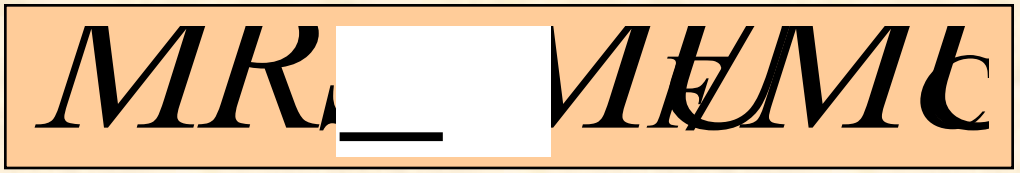


Marginal Utility and Consumer Choice



- Because:





Marginal Utility and Consumer Choice

- When consumers maximize satisfaction the:

$$MRS_{F,C} = \frac{P_F}{P_C}$$

- Since the MRS is also equal to the ratio of the marginal utilities of consuming *F* and *C*, it follows that:

$$MRS_{F,C} = \frac{MU_F}{MU_C} = \frac{P_F}{P_C}$$

Marginal Utility and Consumer Choice

- Which gives the equation for utility maximization:

$$MU_F / P_F = MU_C / P_C$$