



Ch. 3 Consumer Behaviour

- How are consumer preferences used to determine demand?
- How do consumers allocate income to the purchase of different goods?
- How do consumers with limited income decide what to buy?



Consumer Behavior

- The theory of consumer behavior can be used to help answer these and many more questions
- *Theory of consumer behavior*
 - The explanation of how consumers allocate income to the purchase of different goods and services

Consumer Behavior

- There are three steps involved in the study of consumer behavior
 1. *Consumer Preferences*
 - To describe how and why people prefer one good to another
 2. *Budget Constraints*
 - People have limited incomes
 3. Given preferences and limited incomes, what amount and type of goods will be purchased?
 - What combination of goods will consumers buy to maximize their satisfaction?



Consumer Preferences

- How might a consumer compare different groups of items available for purchase?
- A *market basket* is a collection of one or more commodities
- Individuals can choose between market baskets containing different goods

Consumer Preferences – Basic Assumptions

1. Preferences are *complete*
 - Consumers can rank market baskets
2. Preferences are *transitive*
 - If they prefer A to B, and B to C, they must prefer A to C
3. Consumers *always prefer more* of any good to less
 - More is better

Consumer Preferences

- Consumer preferences can be represented graphically using *indifference curves*
- Indifference curves represent all combinations of market baskets that the person is *indifferent to*
 - A person will be equally satisfied with either choice

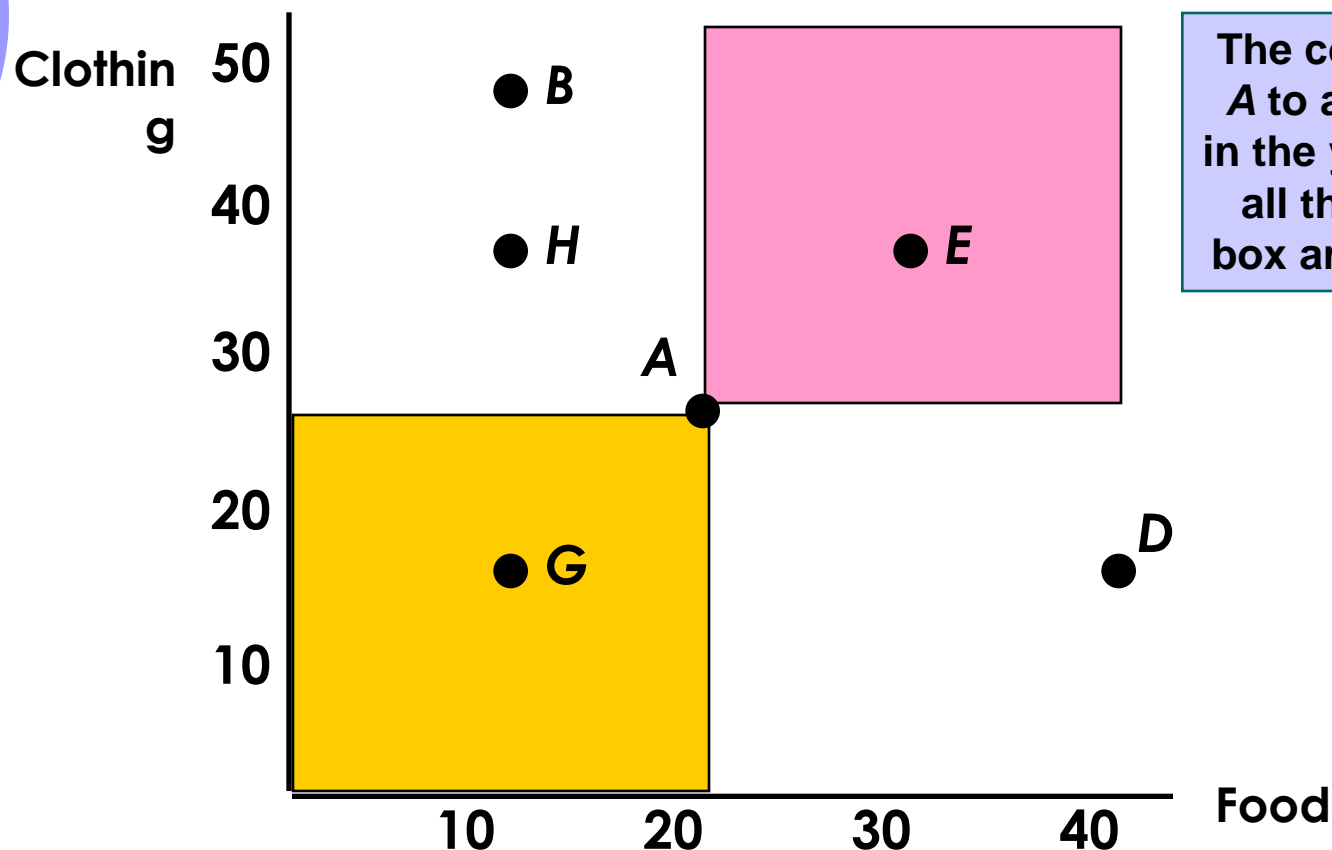
Indifference Curves: An Example

Market Basket	Units of Food	Units of Clothing	Total Units
A	20	30	50
B	10	50	60
D	40	20	60
E	30	40	70
G	10	20	30
H	10	40	50

Indifference Curves: An Example

- Graph the points with one good on the x-axis and one good on the y-axis
- Plotting the points, we can make some immediate observations about preferences
 - More is better

Indifference Curves: An Example

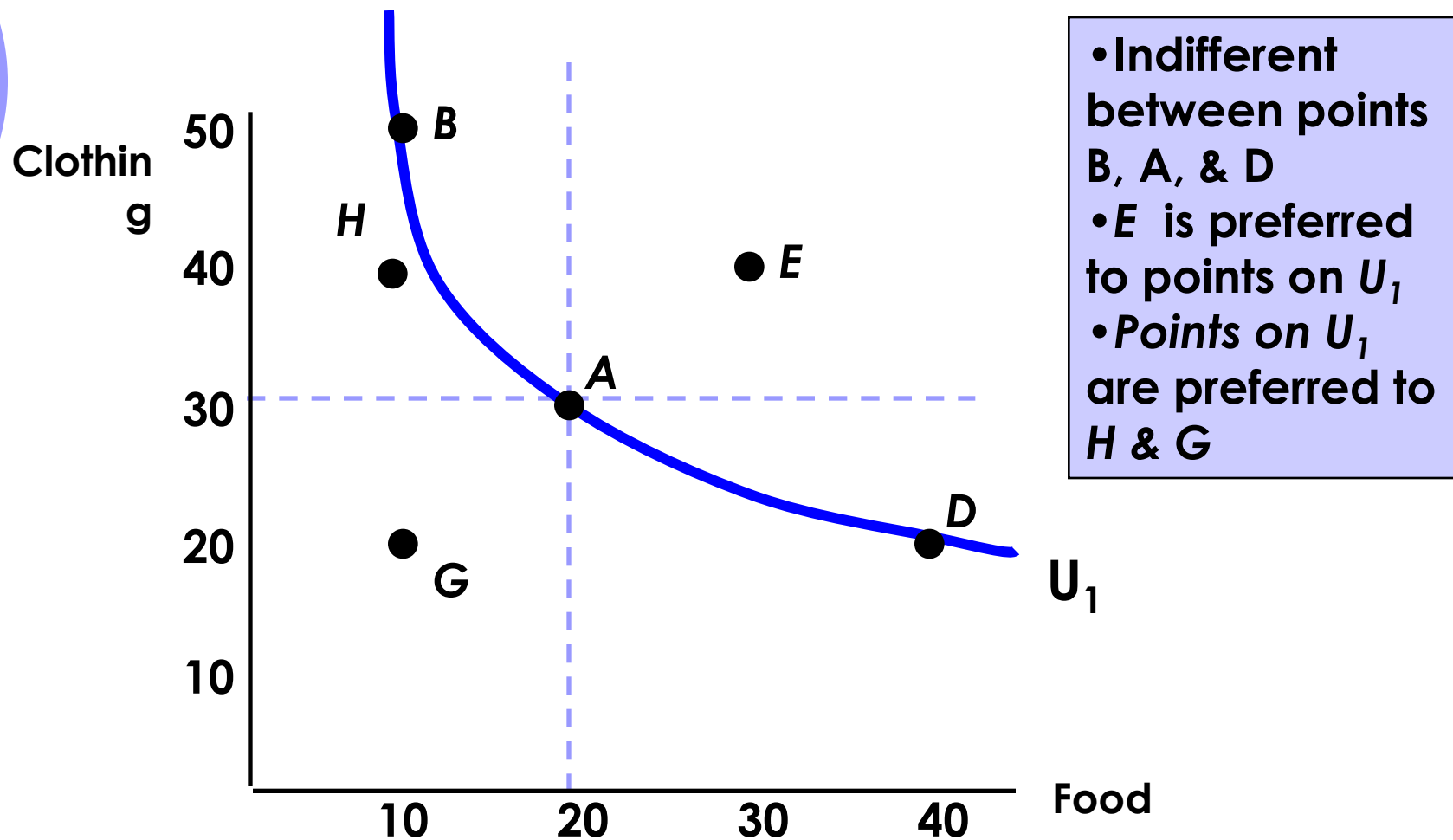


The consumer prefers A to all combinations in the yellow box, while all those in the pink box are preferred to A.

Indifference Curves: An Example

- Points such as B & D have more of one good but less of another compared to A
 - Need more information about consumer ranking
- Consumer may decide they are indifferent between B, A and D
 - We can then connect those points with an indifference curve
- Any market basket lying northeast of an indifference curve is preferred to any market basket that lies on the indifference curve
- Points on the curve are preferred to points southwest of the curve

Indifference Curves: An Example



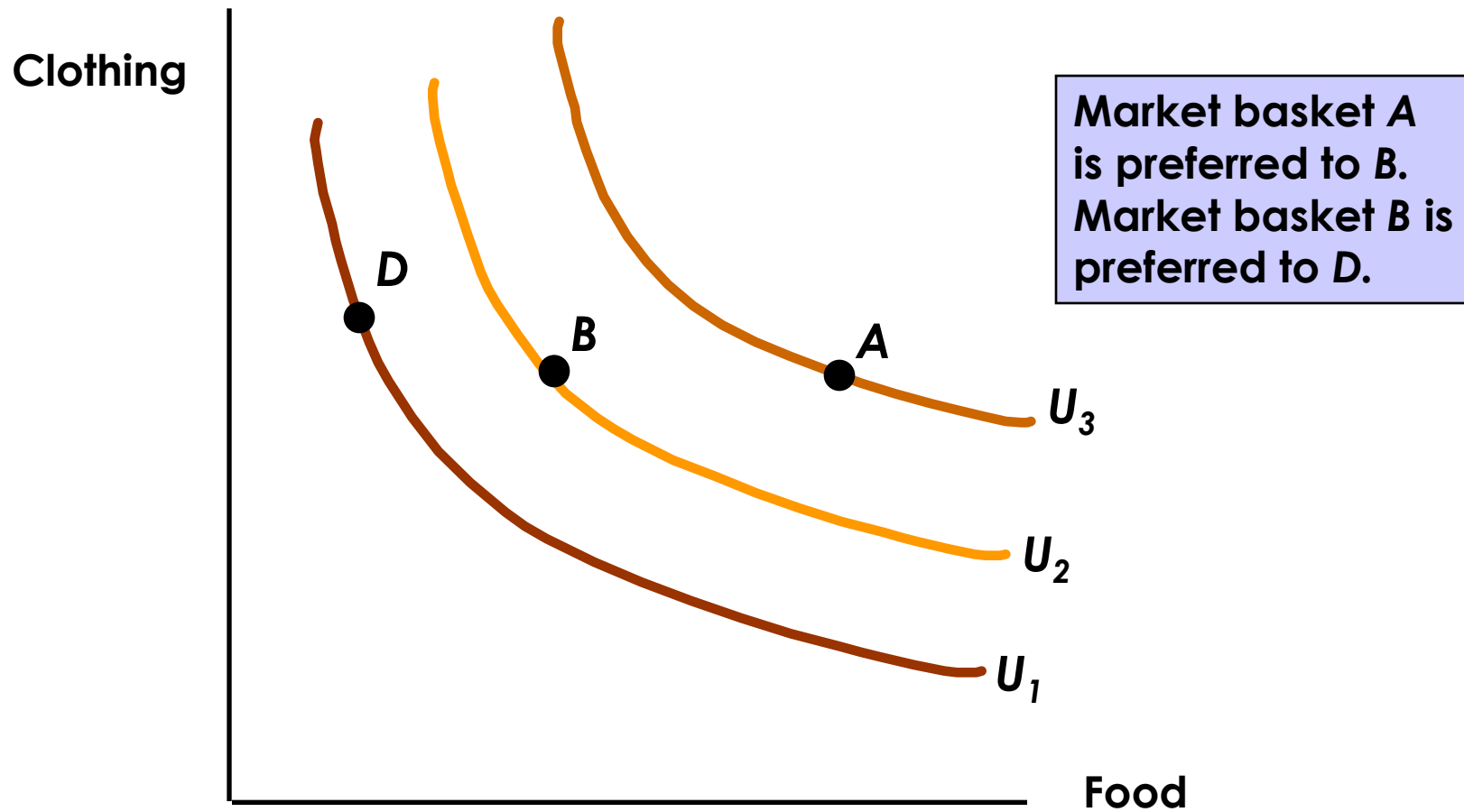
Indifference Curves

- Indifference curves slope downward to the right
 - If they sloped upward, they would violate the assumption that more is preferred to less
 - Some points that had more of both goods would be indifferent to a basket with less of both goods

Indifference Curves

- To describe preferences for all combinations of goods/services, we have a set of indifference curves – an *indifference map*
 - Each indifference curve in the map shows the market baskets among which the person is indifferent
 - Indifference maps give more information about shapes of indifference curves

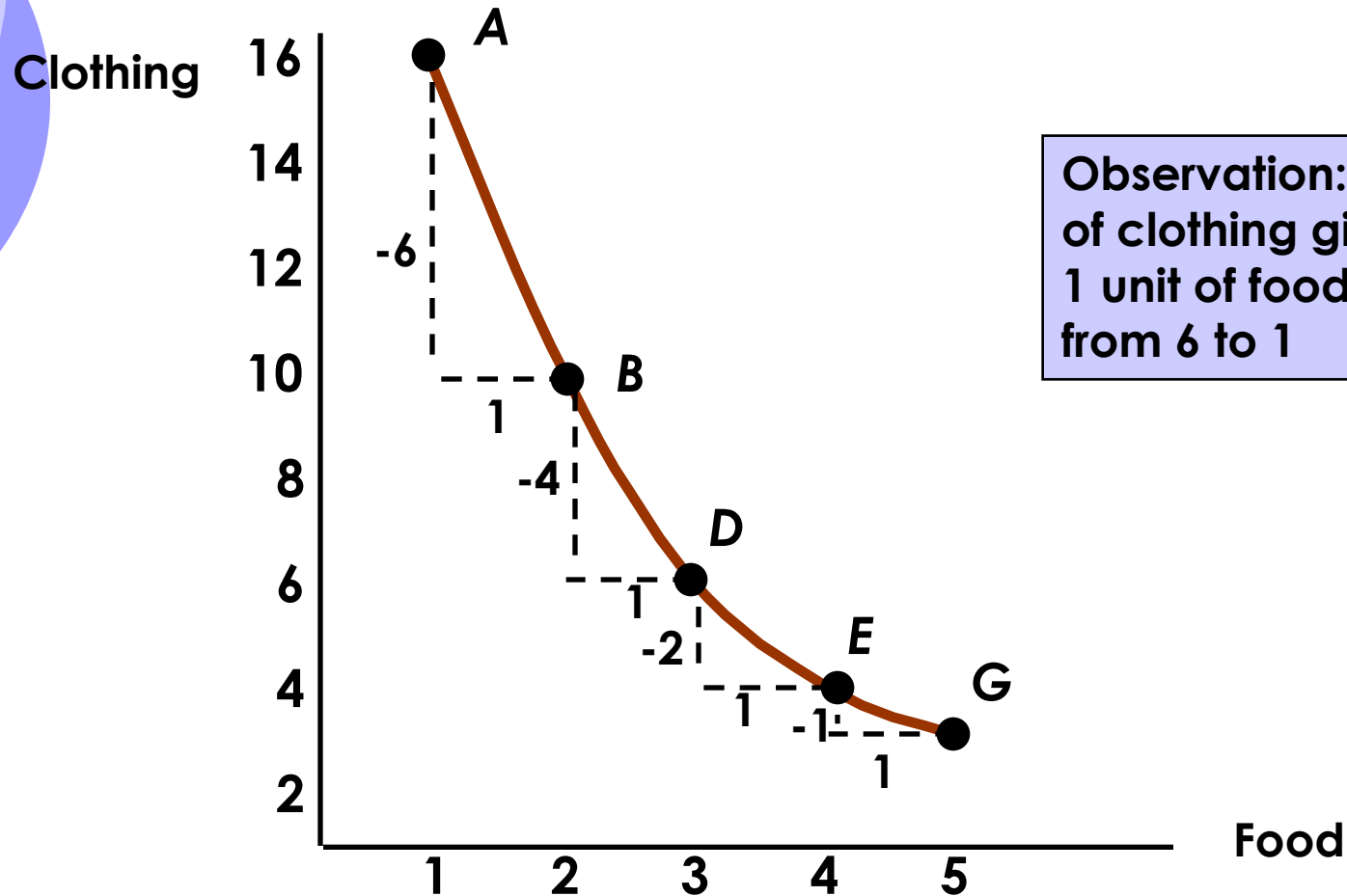
Indifference Map



Indifference Curves

- The shapes of indifference curves describe how a consumer is willing to substitute one good for another
 - A to B, give up 6 clothing to get 1 food
 - D to E, give up 2 clothing to get 1 food
- The more clothing and less food a person has, the more clothing they will give up to get more food

Indifference Curves

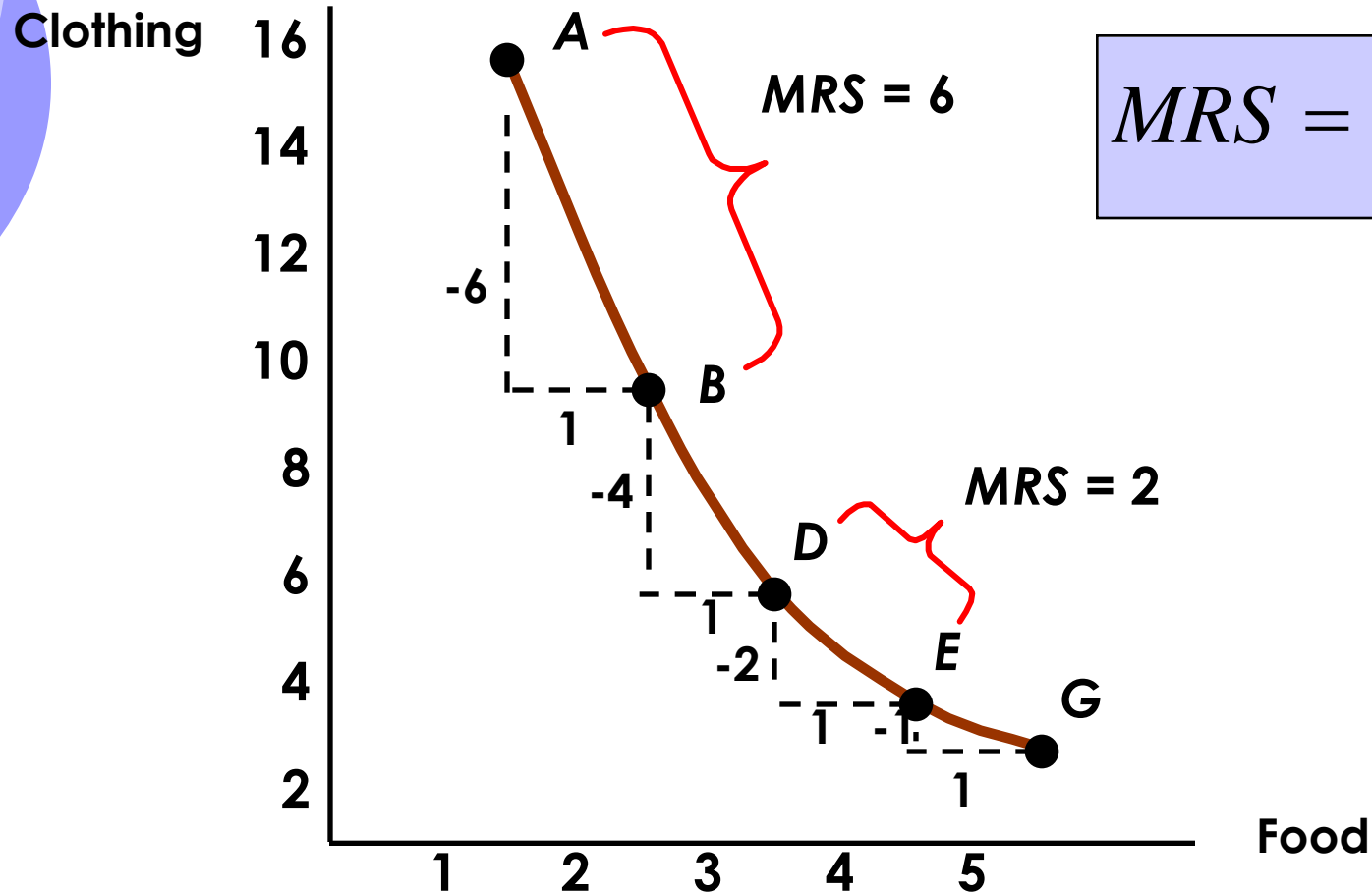


Observation: The amount of clothing given up for 1 unit of food decreases from 6 to 1

Indifference Curves

- We measure how a person trades one good for another using the *marginal rate of substitution (MRS)*
 - It 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

Marginal Rate of Substitution



Marginal Rate of Substitution

- Indifference curves are convex
 - As more of one good is consumed, a consumer would prefer to give up fewer units of a second good to get additional units of the first one
- Consumers generally prefer a balanced market basket
- The MRS decreases as we move down the indifference curve
 - Along an indifference curve there is a *diminishing marginal rate of substitution*.
 - The MRS went from 6 to 4 to 1



Marginal Rate of Substitution

- Indifference curves with different shapes imply a different willingness to substitute
- Two polar cases are of interest
 - Perfect substitutes
 - Perfect complements

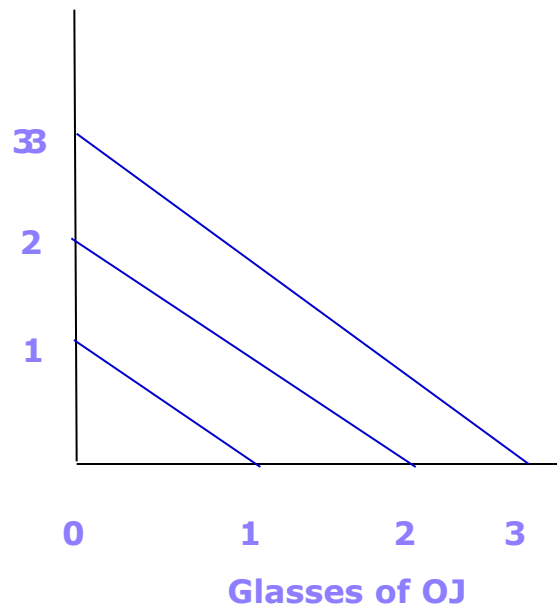
Marginal Rate of Substitution

- Perfect Substitutes
 - Two goods are perfect substitutes when the marginal rate of substitution of one good for the other is constant
 - A person might consider apple juice and orange juice perfect substitutes & ALWAYS trade 1 OJ for 1 AJ
- Perfect Complements
 - Two goods are perfect complements when the indifference curves for the goods are shaped as right angles
 - e.g.: If you have 1 left shoe and 1 right shoe, you are indifferent between having more left shoes only

Consumer Preferences

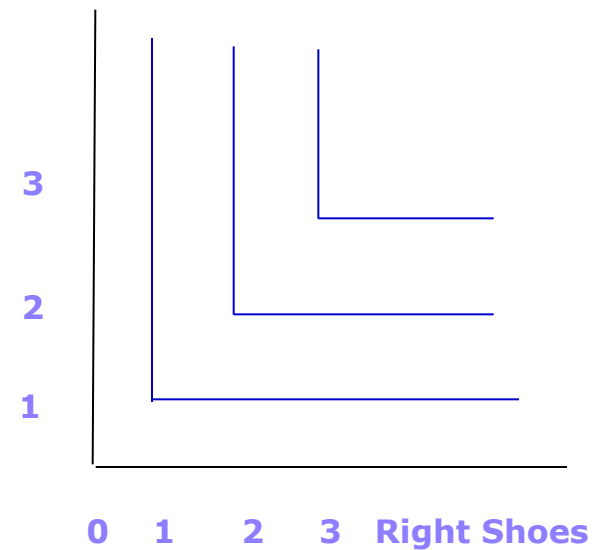
Perfect Substitutes

Glasses of AJ



Perfect Complements

Left Shoes





Consumer Preferences

- The theory of consumer behavior does not required assigning a numerical value to the level of satisfaction
- Although ranking of market baskets is good, sometimes numerical value is useful

Consumer Preferences

- Utility

- A 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

Utility

- *Utility function*

- Formula that assigns a level of utility to individual market baskets
- If the utility function is

$$U(F,C) = F + 2C$$

A market basket with 8 units of food and 3 units of clothing gives a utility of

$$14 = 8 + 2(3)$$

Utility - Example

Market Basket	Food	Clothing	Utility
A	8	3	$8 + 2(3) = 14$
B	6	4	$6 + 2(4) = 14$
C	4	4	$4 + 2(4) = 12$

Consumer is indifferent between A & B and prefers both to C

Utility

- Although we numerically rank baskets and indifference curves, numbers are ONLY for ranking
- A utility of 4 is not necessarily twice as good as a utility of 2
- This is called ordinal ranking (as opposed to cardinal ranking)

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
 - We assume only 2 goods are consumed, so we do not consider savings

The Budget Line

- Let F equal the amount of food purchased, and C is the amount of clothing
- 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
- The budget line then can be written:

$$P_F F + P_C C = I$$

All income is allocated to food (F) and/or clothing (C)

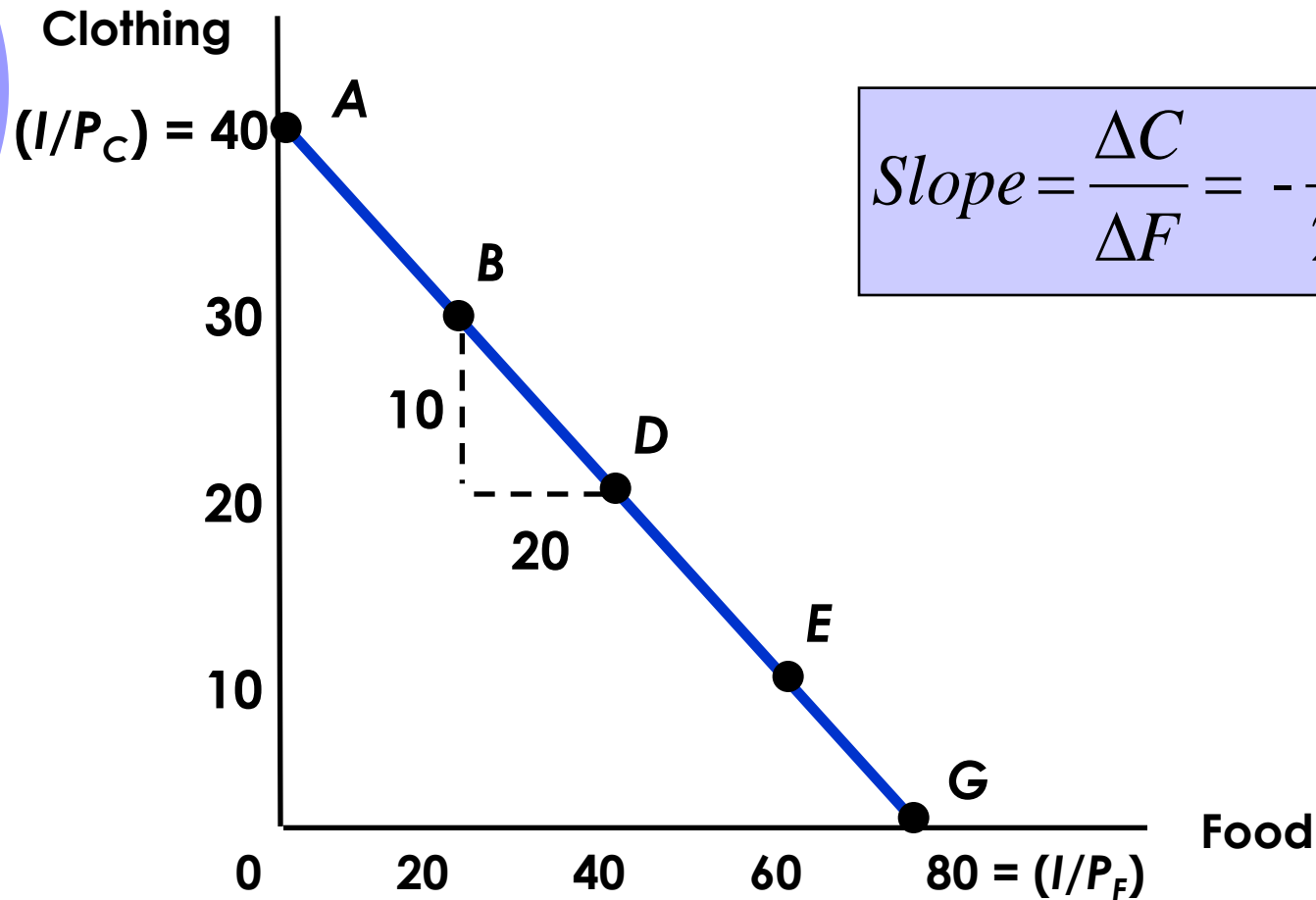
The Budget Line

- Different choices of food and clothing can be calculated that use all income
 - These choices can be graphed as the budget line
- Example:
 - Assume income of \$80/week, $P_F = \$1$ and $P_C = \$2$

Budget Constraints

Market Basket	Food $P_F = \$1$	Clothing $P_C = \$2$	Income $I = P_F F + P_C C$
A	0	40	\$80
B	20	30	\$80
D	40	20	\$80
E	60	10	\$80
G	80	0	\$80

The Budget Line





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 slope is the negative of the ratio of the prices of the two goods

The Budget Line

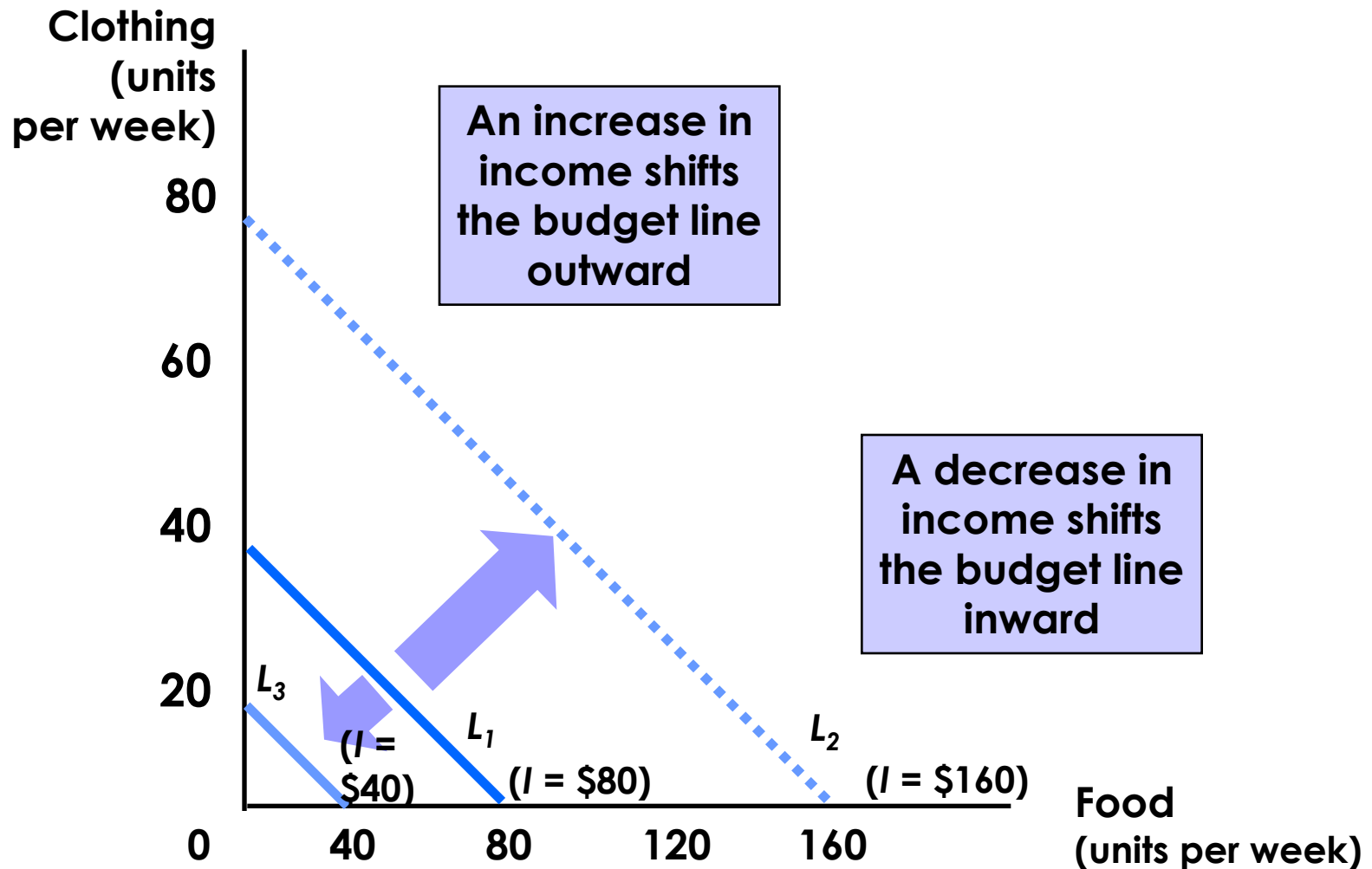
- The slope indicates the rate at which the two goods can be substituted without changing the amount of money spent.
- The Budget Line
 - The vertical intercept, I/P_C , illustrates the maximum amount of C that can be purchased with income I
 - The horizontal intercept, I/P_F , illustrates the maximum amount of F that can be purchased with income I

The Budget Line - Changes

- The Effects of Changes in Income

- An increase in income causes the budget line to shift outward, parallel to the original line (holding prices constant).
- Can buy more of both goods with more income
- A decrease in income causes the budget line to shift inward, parallel to the original line (holding prices constant)
- Can buy less of both goods with less income

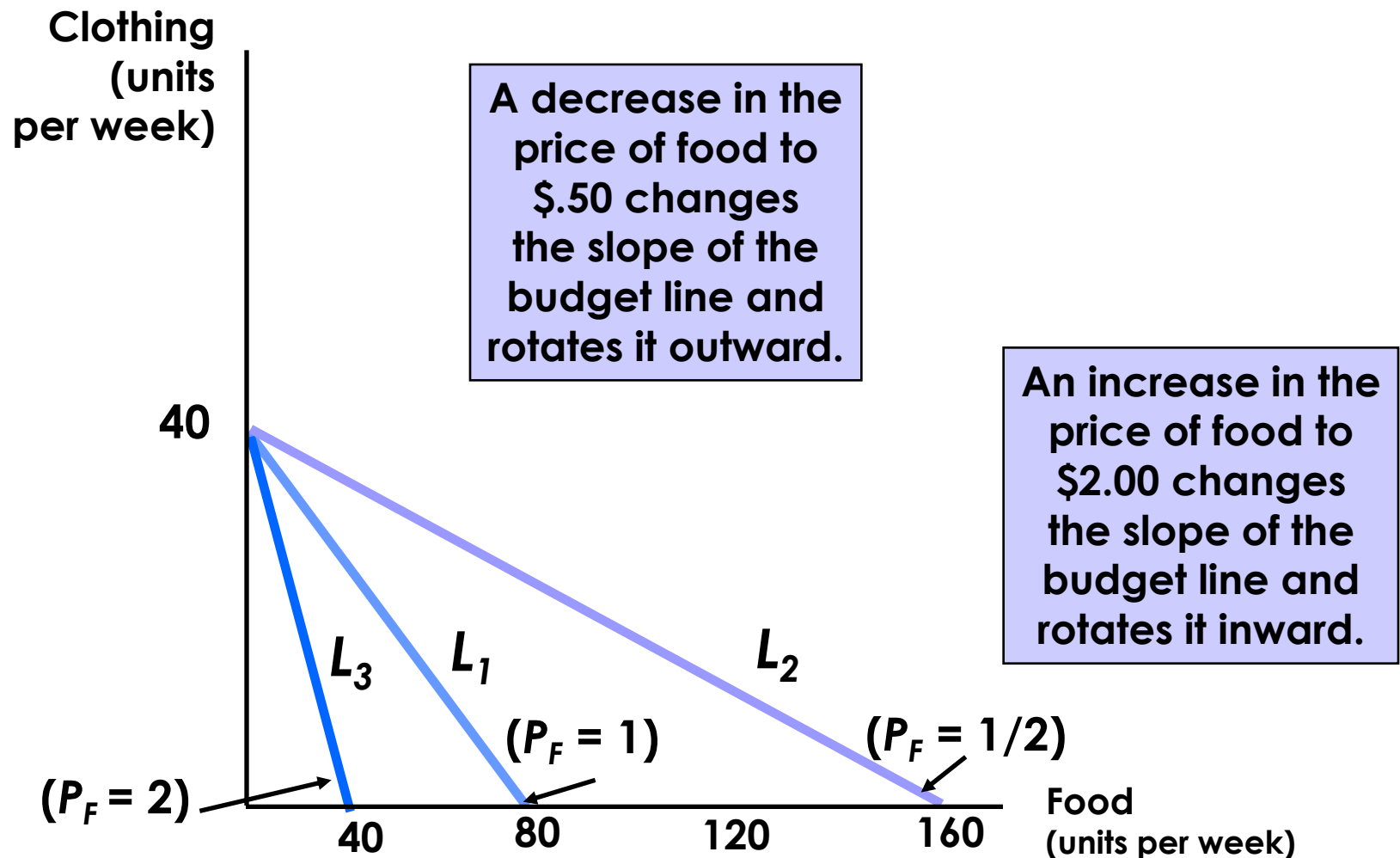
The Budget Line - Changes



The Budget Line - Changes

- The Effects of Changes in Prices
 - If the price of one good increases (decreases), the budget line shifts inward (outward), pivoting from the other good's intercept.
 - If the price of food increases (decreases) and you buy only food (x-intercept), then you can buy less (more) food. The x-intercept shifts in (out).
 - If you buy only clothing (y-intercept), you can buy the same amount. No change in y-intercept.

The Budget Line - Changes



Consumer Choice

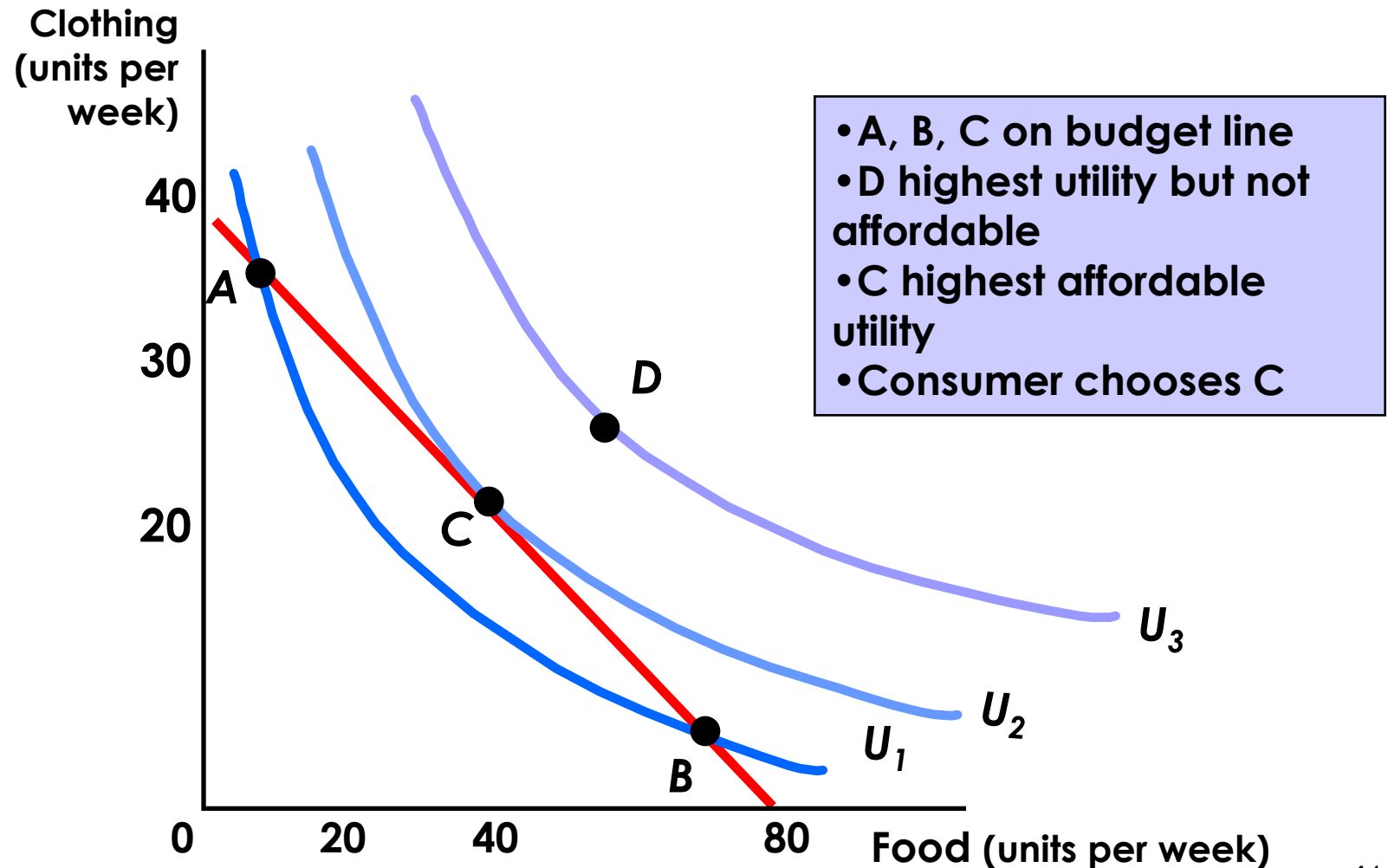
- Given preferences and budget constraints, how do consumers choose what to buy?
- Consumers choose a combination of goods that will maximize their satisfaction, given the limited budget available to them
- The maximizing market basket must satisfy two conditions:
 1. It must be located on the budget line
 - They spend all their income – more is better
 2. It must give the consumer the most preferred combination of goods and services



Consumer Choice

- Graphically, we can see different indifference curves of a consumer choosing between clothing and food
- Remember that $U_3 > U_2 > U_1$ for our indifference curves
- Consumer wants to choose highest utility within their budget

Consumer Choice





Consumer Choice

- Consumer will choose highest indifference curve on budget line
- In previous graph, point C is where the indifference curve is just tangent to the budget line
- Slope of the budget line equals the slope of the indifference curve at this point

Consumer Choice

- Recall, the slope of an indifference curve is:

$$MRS = - \frac{\Delta C}{\Delta F}$$

Further, the slope of the budget line is:

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

- Therefore, it can be said at consumer's optimal consumption point,

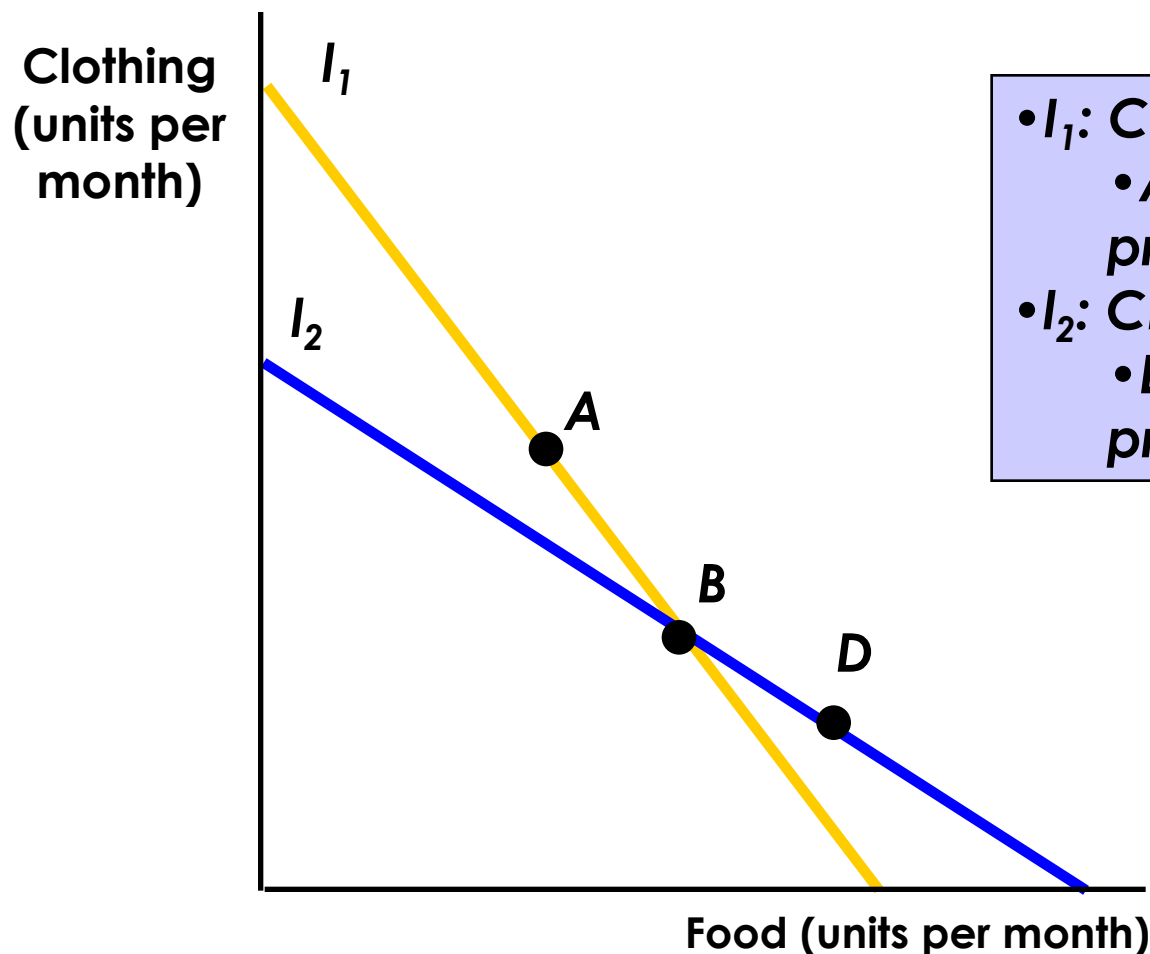
$$MRS = \frac{P_F}{P_C}$$



Revealed Preferences

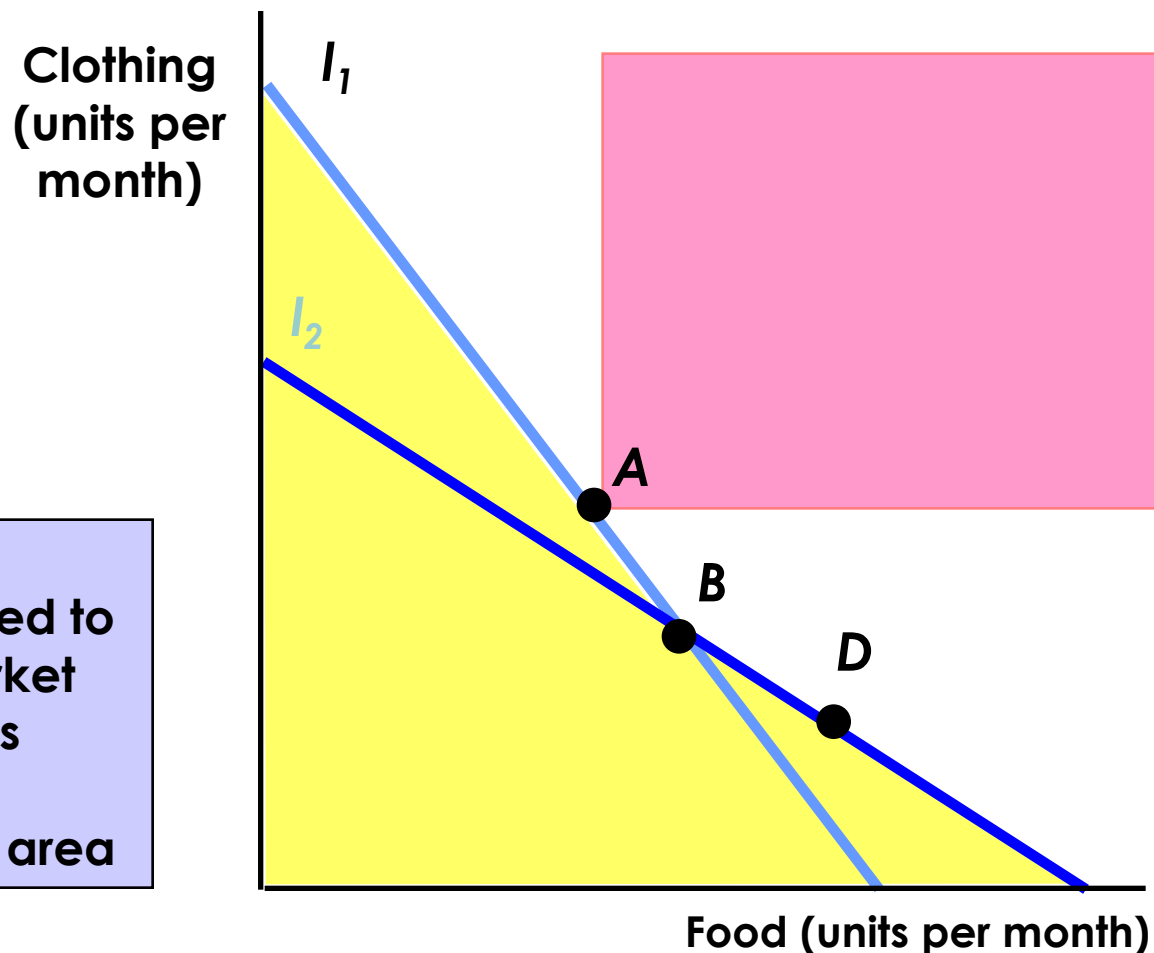
- If we know the choices a consumer has made, we can determine what their preferences are if we have information about a sufficient number of choices that are made when prices and incomes vary.

Revealed Preferences – Two Budget Lines



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

Revealed Preferences – Two Budget Lines



B is preferred to all market baskets in the yellow area

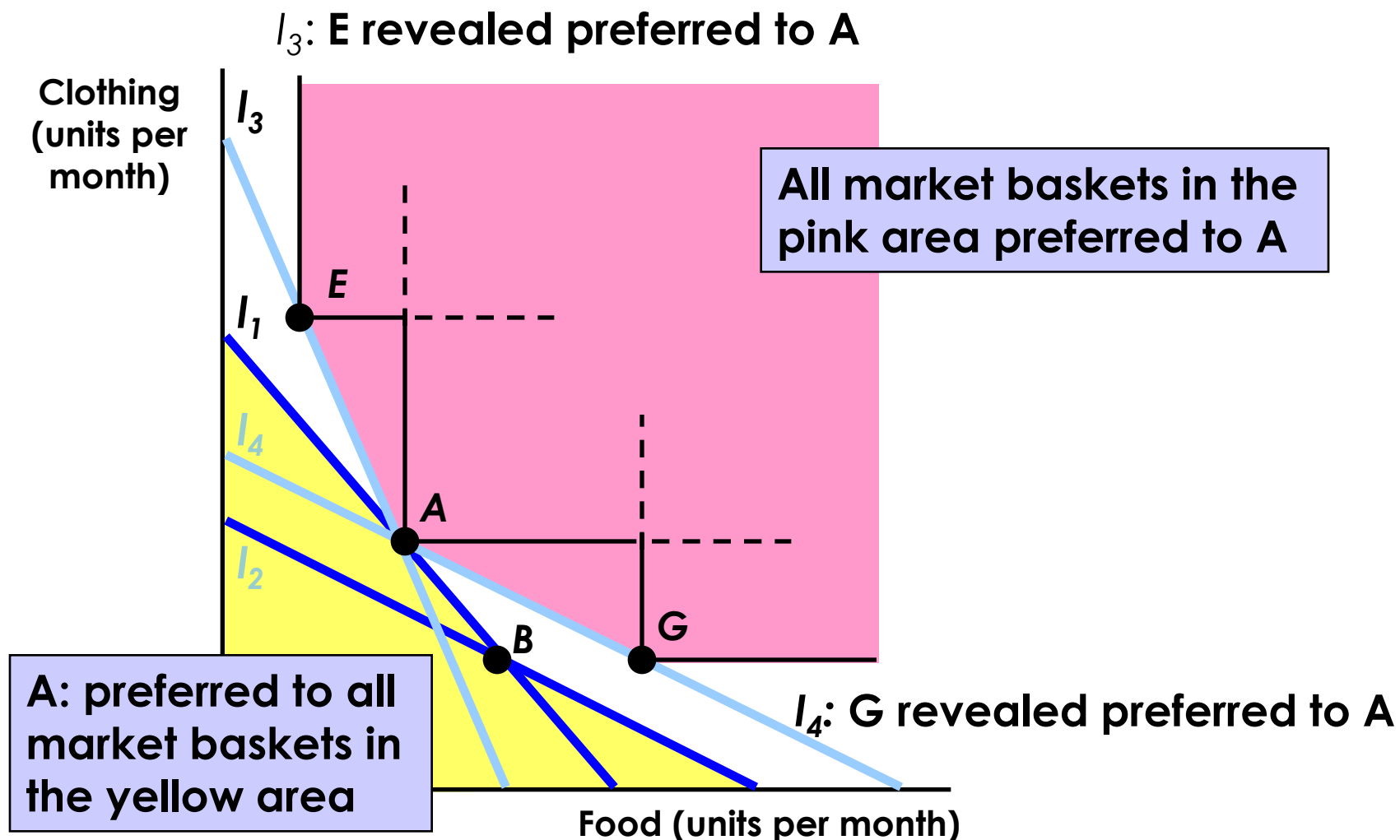
All market baskets in the pink shaded area are preferred to A.



Revealed Preference

- As you continue to change the budget line, individuals can tell you which basket they prefer to others
- The more the individual reveals, the more you can discern about their preferences
- Eventually you can map out an indifference curve

Revealed Preferences – Four Budget Lines



Marginal Utility and Consumer Choice

- *Marginal utility* measures the additional satisfaction obtained from consuming one additional unit of a good
 - How much happier is the individual from consuming one more unit of food?
- The principle of *diminishing marginal utility* states that as more of a good is consumed, the additional utility the consumer gains will be smaller and smaller
(e.g) MU from 0 to 1 units of food=9 but MU from 1 to 2 = 7 & MU from 2-3 = 5 etc...
- Note that total utility will continue to increase since consumer makes choices that make them happier

Marginal Utility and Indifference Curves

- As consumption moves along an indifference curve:
 - 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)
 - Formally:

$$0 = MU_F(\Delta F) + MU_C(\Delta C)$$

- No change in total utility along an indifference curve. Trade off of one good to the other leaves the consumer just as well off.

Marginal Utility and Consumer Choice

- Rearranging:

$$-(\Delta C / \Delta F) = MU_F / MU_C$$

Since

$$-(\Delta C / \Delta F) = MRS \text{ of } F \text{ for } C$$

We can say

$$MRS = MU_F / MU_C$$

Marginal Utility and Consumer Choice

- When consumers maximize satisfaction:

$$\mathbf{MRS = P_F / P_C}$$

Since the MRS is also equal to the ratio of the marginal utility of consuming F and C

$$\mathbf{MU_F / MU_C = P_F / P_C}$$

Rearranging, gives the equation for utility maximization:

$$\mathbf{MU_F / P_F = MU_C / P_C}$$



Marginal Utility and Consumer Choice

- Total utility is maximized when the budget is allocated so that the marginal utility per dollar of expenditure is the same for each good.
- This is referred to as the equal marginal principle.