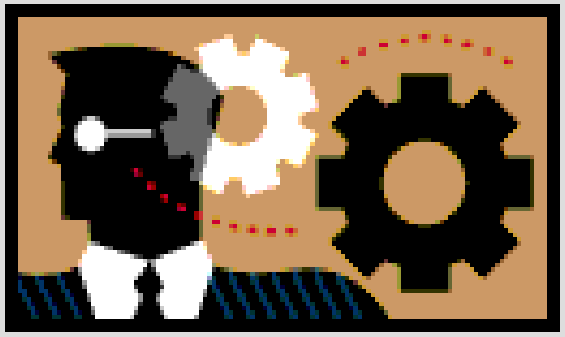
Managerial Economics & Business Strategy

Chapter 4

The Theory of Individual Behavior



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Overview

I. Consumer Behavior
- Indifference Curve Analysis
- Consumer Preference Ordering

II. Constraints
- The Budget Constraint
- Changes in Income
- Changes in Prices

III. Consumer Equilibrium

IV. Indifference Curve Analysis & Demand Curves
- Individual Demand
- Market Demand

Consumer Behavior

- Consumer Opportunities
  - The possible goods and services consumer can afford to consume.
- Consumer Preferences
  - The goods and services consumers actually consume.
- Given the choice between 2 bundles of goods a consumer either
  - Prefers bundle A to bundle B: $A \succ B$.
  - Prefers bundle B to bundle A: $A \prec B$.
  - Is indifferent between the two: $A \sim B$.

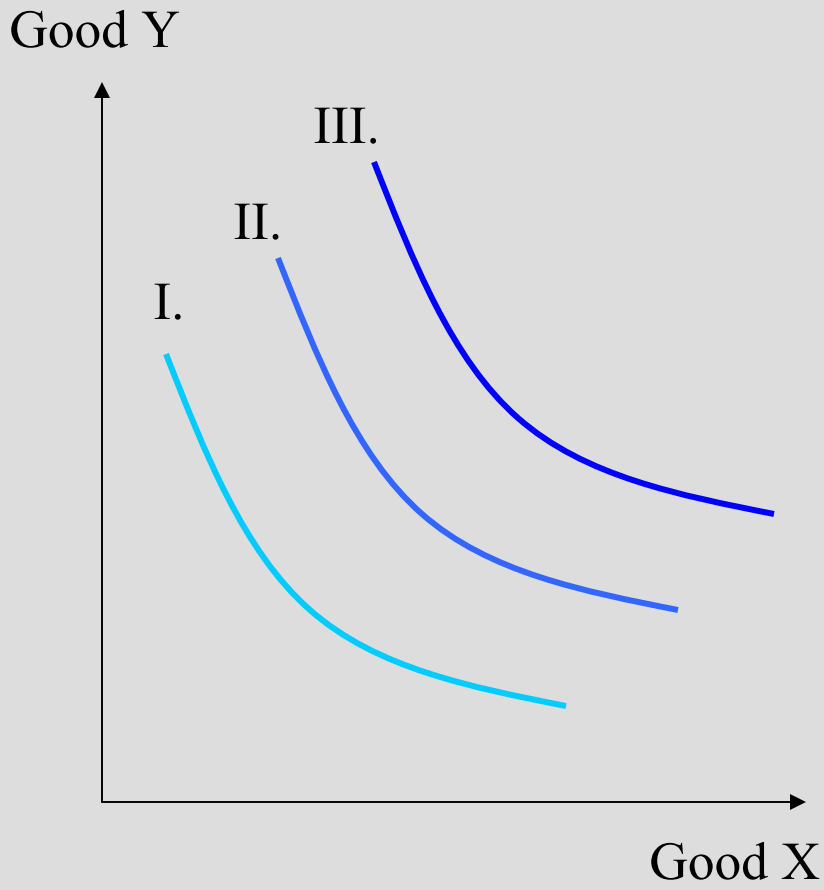
Indifference Curve Analysis

Indifference Curve

- A curve that defines the combinations of 2 or more goods that give a consumer the same level of satisfaction.

Marginal Rate of Substitution

- The rate at which a consumer is willing to substitute one good for another and maintain the same satisfaction level.



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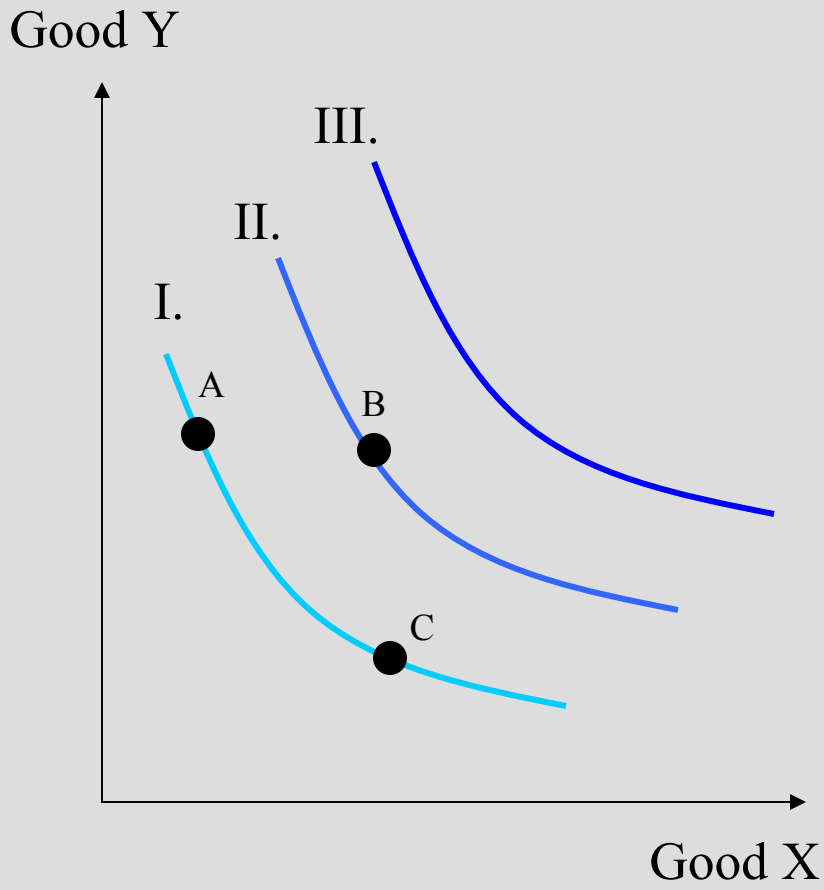
Consumer Preference Ordering Properties

- Completeness
- More is Better
- Diminishing Marginal Rate of Substitution
- Transitivity

Complete Preferences

- Completeness Property
  - Consumer is capable of expressing preferences (or indifference) between all possible bundles. ("I don't know" is NOT an option!)
    - If the only bundles available to a consumer are A, B, and C, then the consumer
      - is indifferent between A and C (they are on the same indifference curve).
      - will prefer B to A.
      - will prefer B to C.



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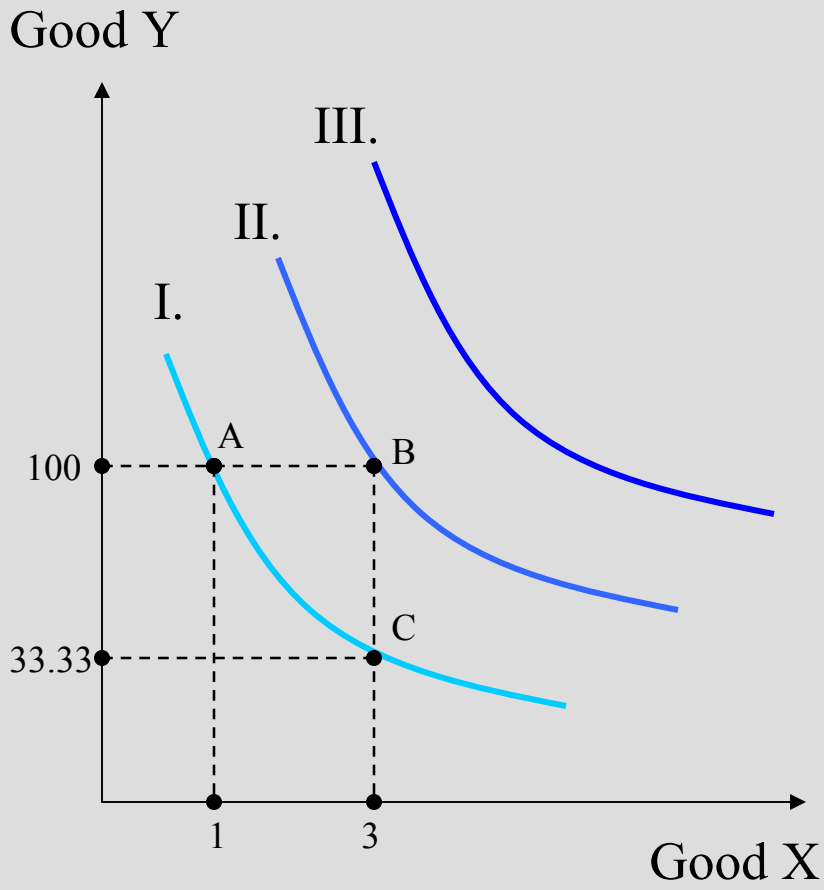
More Is Better!

- More Is Better Property
  - Bundles that have at least as much of every good and more of some good are preferred to other bundles.
    - Bundle B is preferred to A since B contains at least as much of good Y and strictly more of good X.
    - Bundle B is also preferred to C since B contains at least as much of good X and strictly more of good Y.
    - More generally, all bundles on IC_{III} are preferred to bundles on IC_{II} or IC_{I}. And all bundles on IC_{II} are preferred to IC_{I}.



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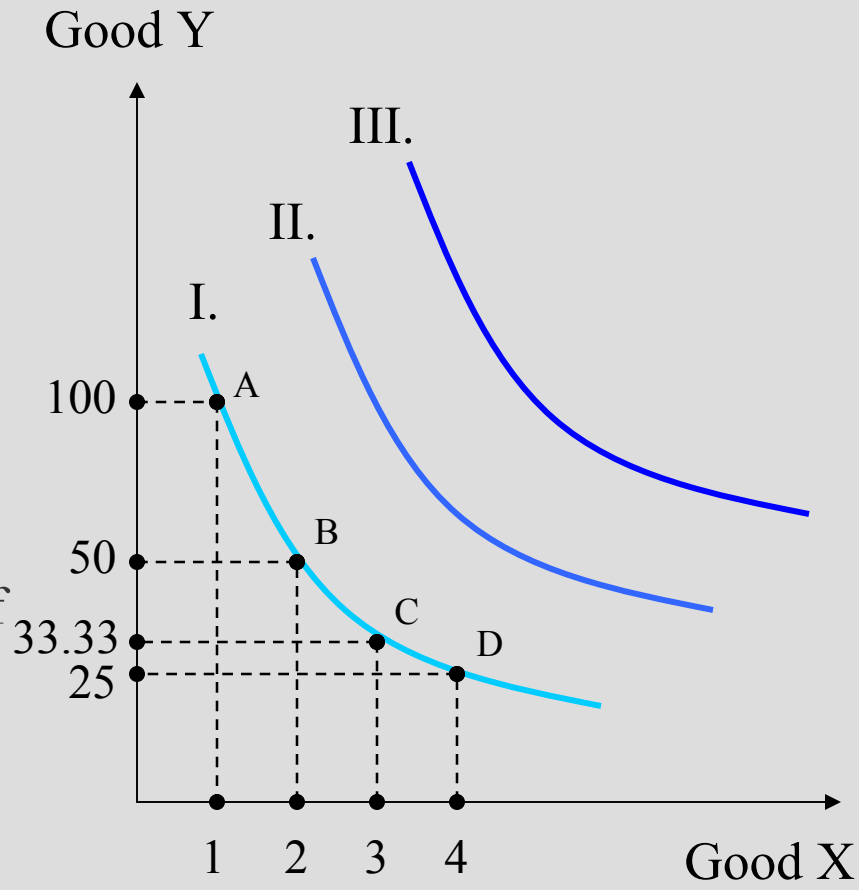
Diminishing Marginal Rate of Substitution

- Marginal Rate of Substitution
  - The amount of good Y the consumer is willing to give up to maintain the same satisfaction level decreases as more of good X is acquired.
  - The rate at which a consumer is willing to substitute one good for another and maintain the same satisfaction level.
- To go from consumption bundle A to B the consumer must give up 50 units of Y to get one additional unit of X.
- To go from consumption bundle B to C the consumer must give up 16.67 units of Y to get one additional unit of X.
- To go from consumption bundle C to D the consumer must give up only 8.33 units of Y to get one additional unit of X.



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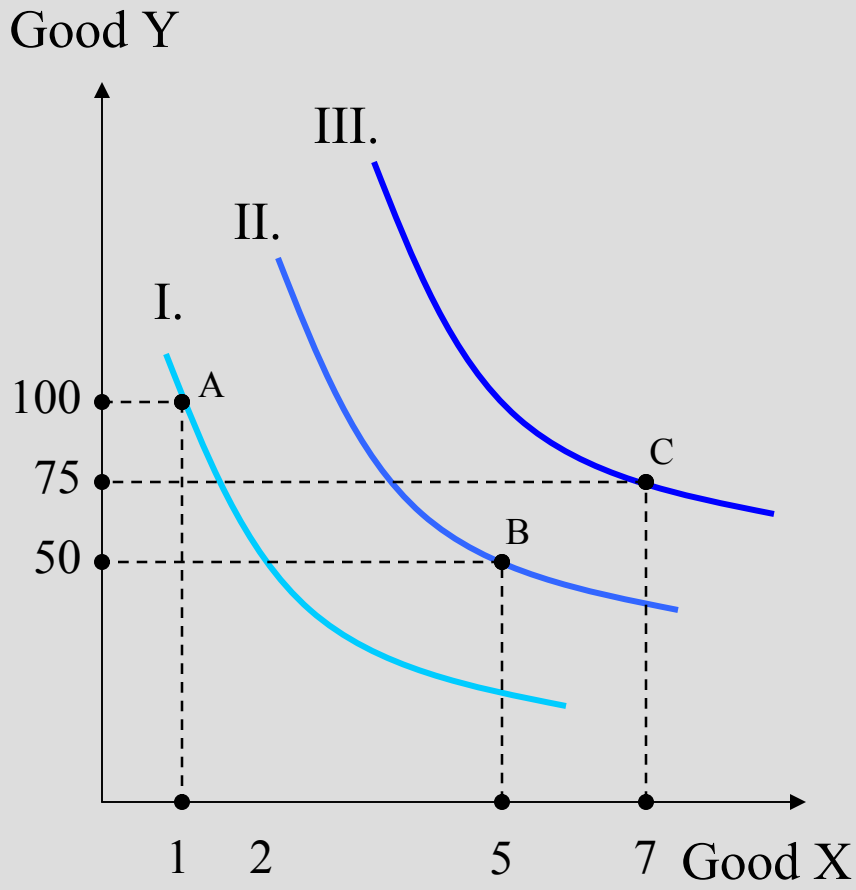
Consistent Bundle Orderings

- Transitivity Property
  - For the three bundles A, B, and C, the transitivity property implies that if $C \succ B$ and $B \succ A$, then $C \succ A$.
  - Transitive preferences along with the more-is-better property imply that
    - indifference curves will not intersect.
    - the consumer will not get caught in a perpetual cycle of indecision.



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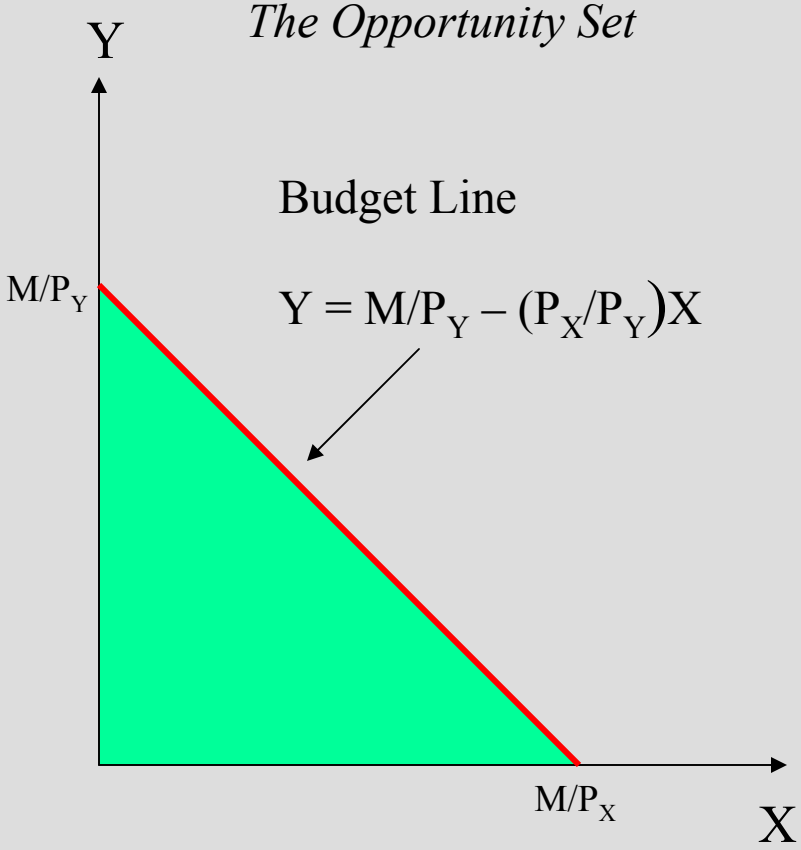
The Budget Constraint

- Opportunity Set
  - The set of consumption bundles that are affordable.
    - $P_x X + P_y Y \leq M$.
- Budget Line
  - The bundles of goods that exhaust a consumers income.
    - $P_x X + P_y Y = M$.
- Market Rate of Substitution
  - The slope of the budget line
    - $-P_x / P_y$



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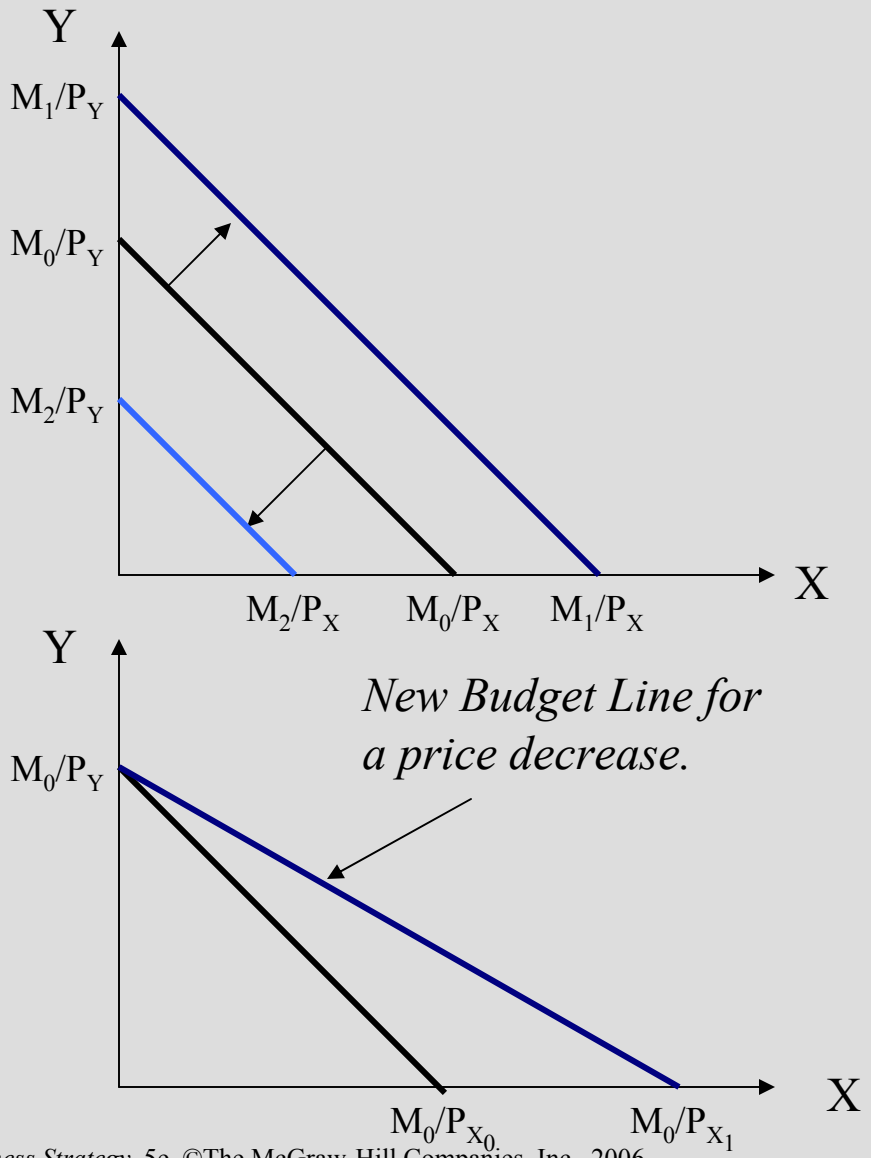
Changes in the Budget Line

- Changes in Income
  - Increases lead to a parallel, outward shift in the budget line ($M_1 > M_0$).
  - Decreases lead to a parallel, downward shift ($M_2 < M_0$).
- Changes in Price
  - A decreases in the price of good X rotates the budget line counter-clockwise ($P_{X_0} > P_{X_1}$).
  - An increases rotates the budget line clockwise (not shown).



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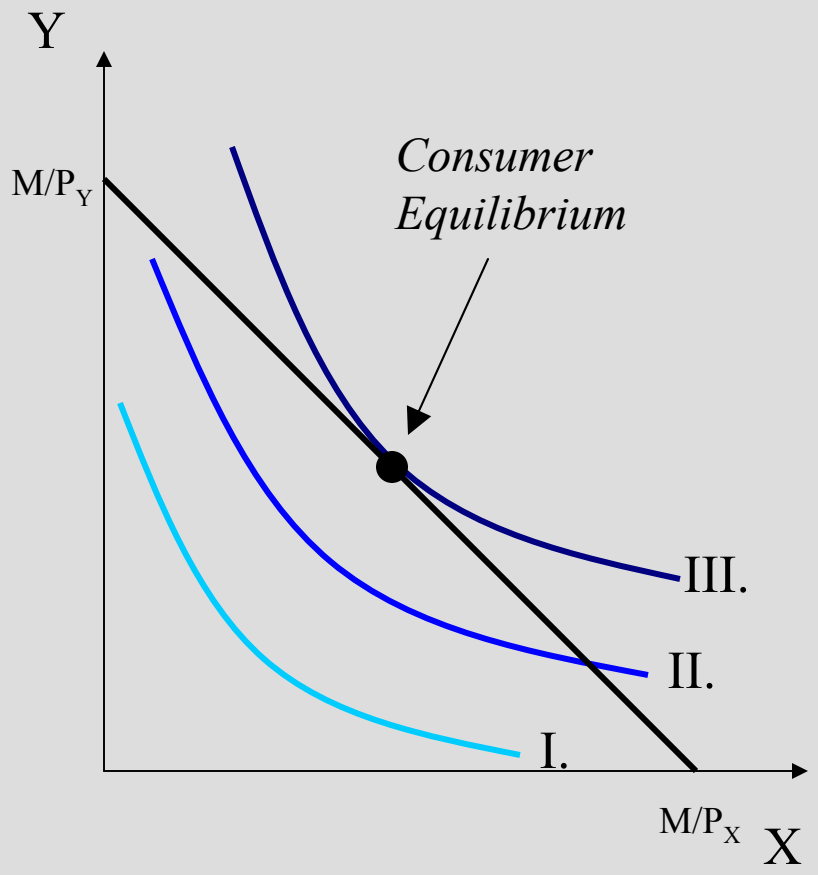
Consumer Equilibrium

- The equilibrium consumption bundle is the affordable bundle that yields the highest level of satisfaction.
  - Consumer equilibrium occurs at a point where
    $$MRS = P_X / P_Y.$$
  - Equivalently, the slope of the indifference curve equals the budget line.



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Price Changes and Consumer Equilibrium

- Substitute Goods
  - An increase (decrease) in the price of good X leads to an increase (decrease) in the consumption of good Y.
    - Examples:
      - Coke and Pepsi.
      - Verizon Wireless or T-Mobile.
- Complementary Goods
  - An increase (decrease) in the price of good X leads to a decrease (increase) in the consumption of good Y.
    - Examples:
      - DVD and DVD players.
      - Computer CPUs and monitors.

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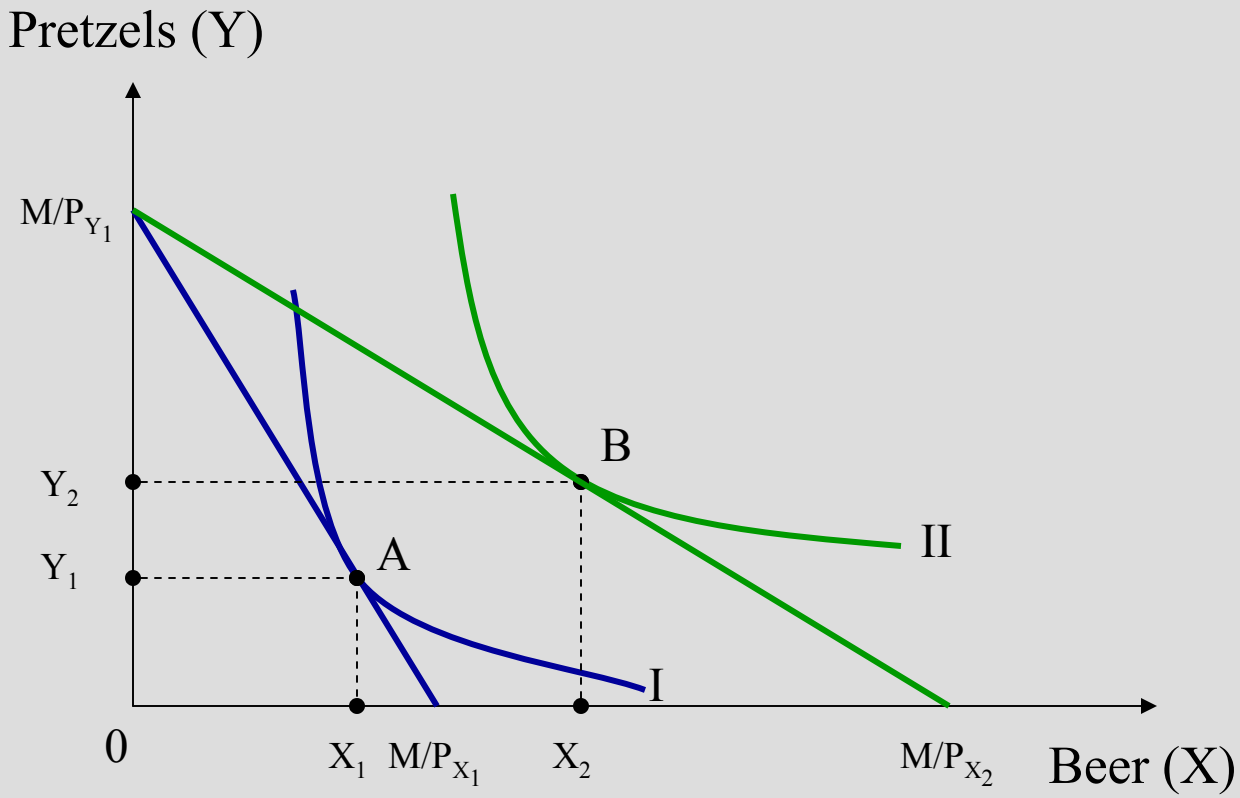
Complementary Goods

When the price of good X falls and the consumption of Y rises, then X and Y are complementary goods. ($P_{X_1} > P_{X_2}$)



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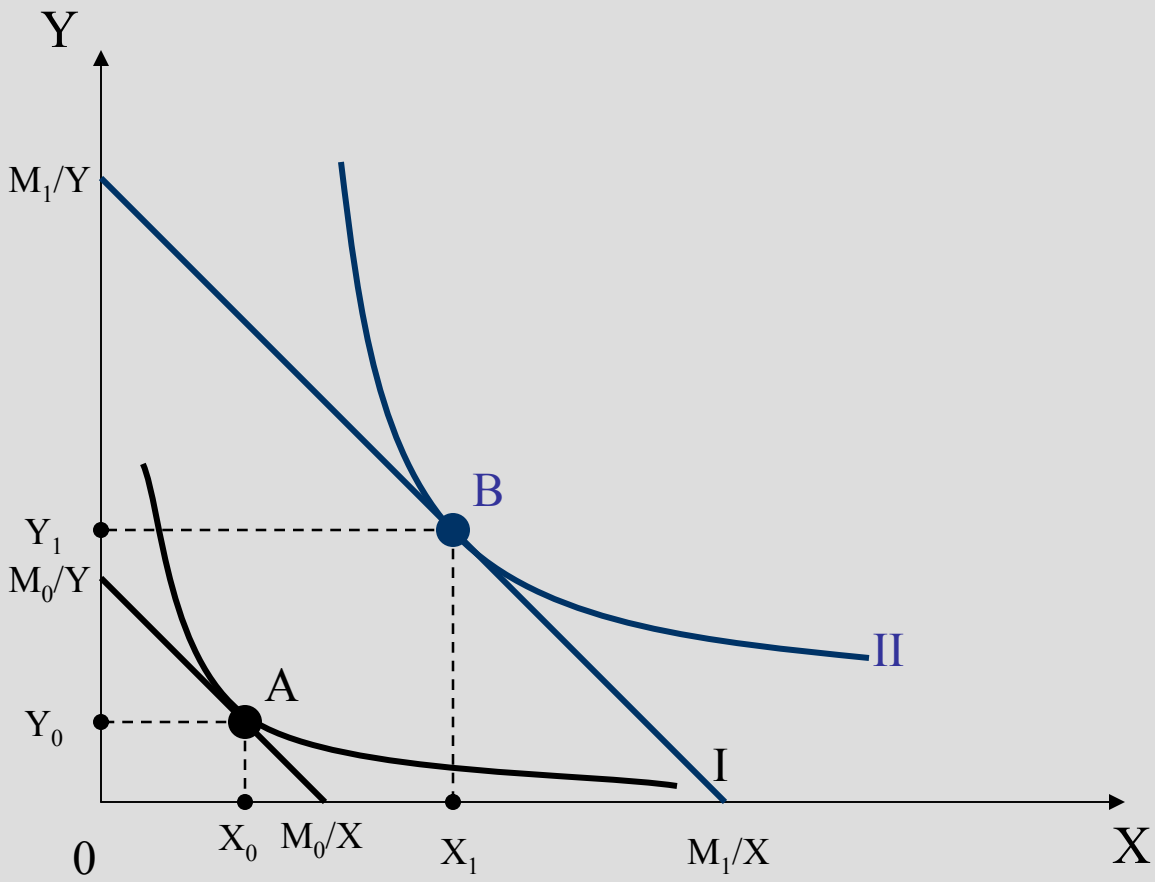
Income Changes and Consumer Equilibrium

- Normal Goods
  - Good X is a normal good if an increase (decrease) in income leads to an increase (decrease) in its consumption.
- Inferior Goods
  - Good X is an inferior good if an increase (decrease) in income leads to a decrease (increase) in its consumption.

Normal Goods

An increase in income increases the consumption of normal goods.

($M_0 < M_1$).



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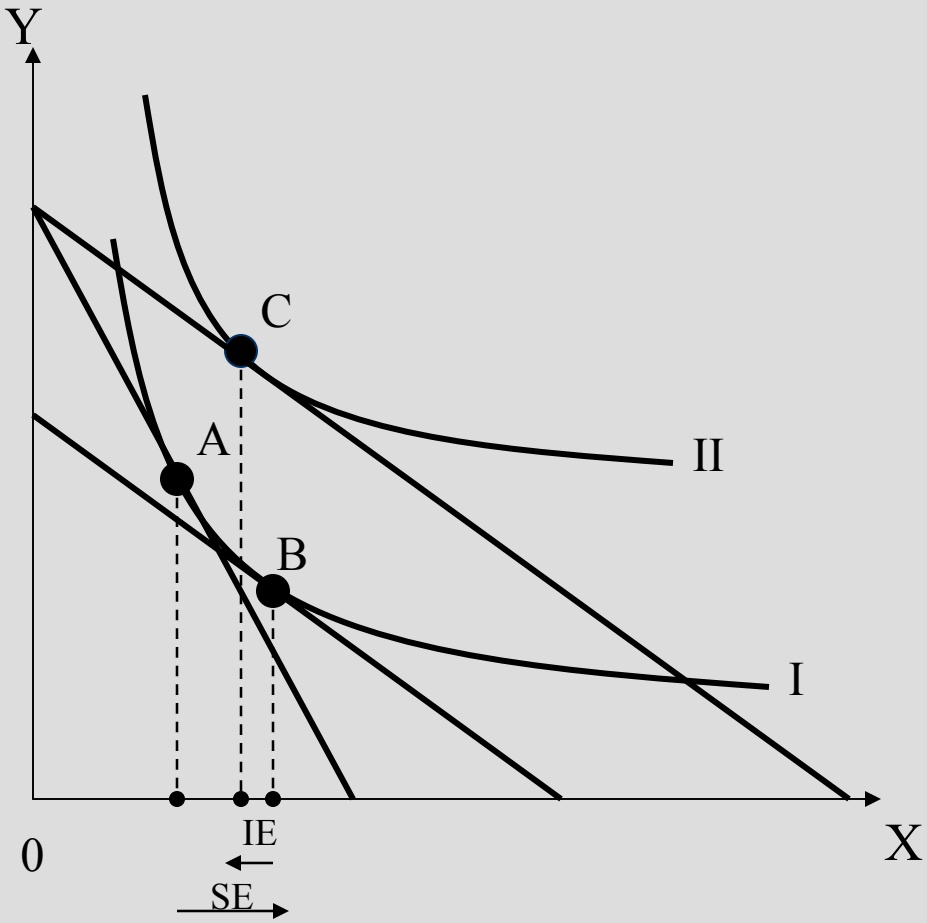
Decomposing the Income and Substitution Effects

Initially, bundle A is consumed. A decrease in the price of good X expands the consumer's opportunity set.

The substitution effect (SE) causes the consumer to move from bundle A to B.

A higher "real income" allows the consumer to achieve a higher indifference curve.

The movement from bundle B to C represents the income effect (IE). The new equilibrium is achieved at point C.



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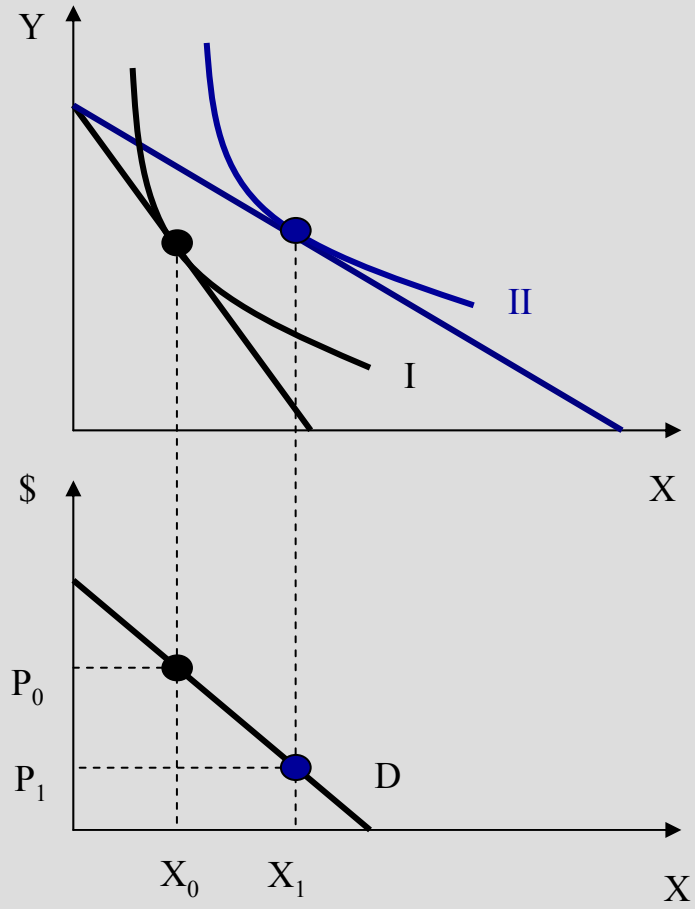
Individual Demand Curve

- An individual's demand curve is derived from each new equilibrium point found on the indifference curve as the price of good X is varied.



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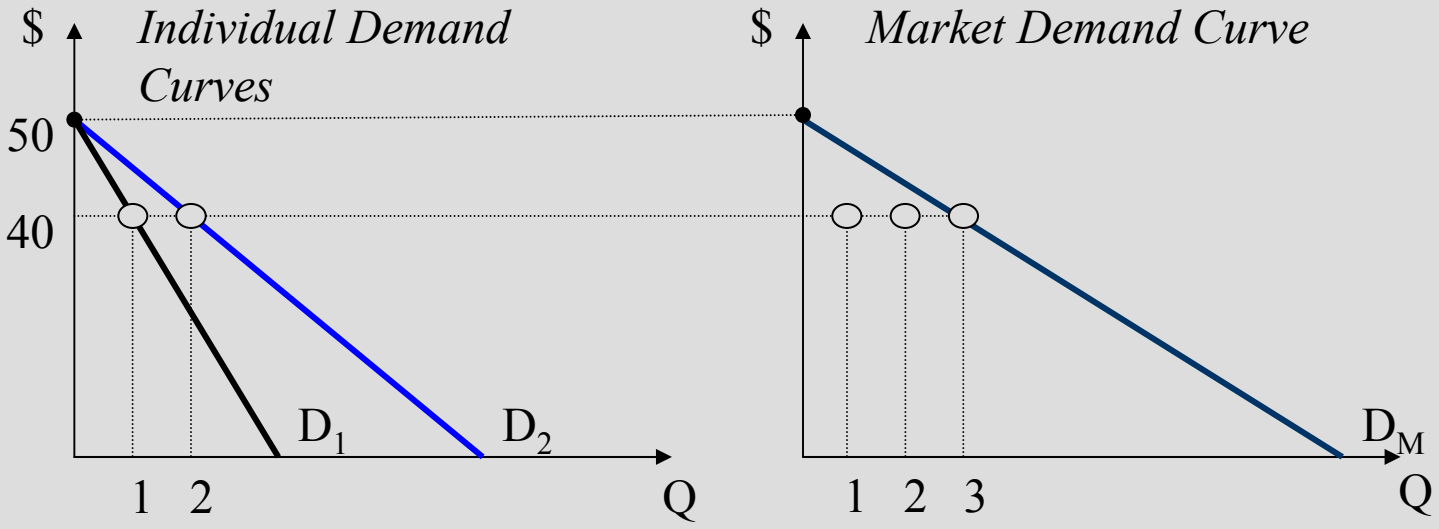
Market Demand

- The market demand curve is the horizontal summation of individual demand curves.
- It indicates the total quantity all consumers would purchase at each price point.



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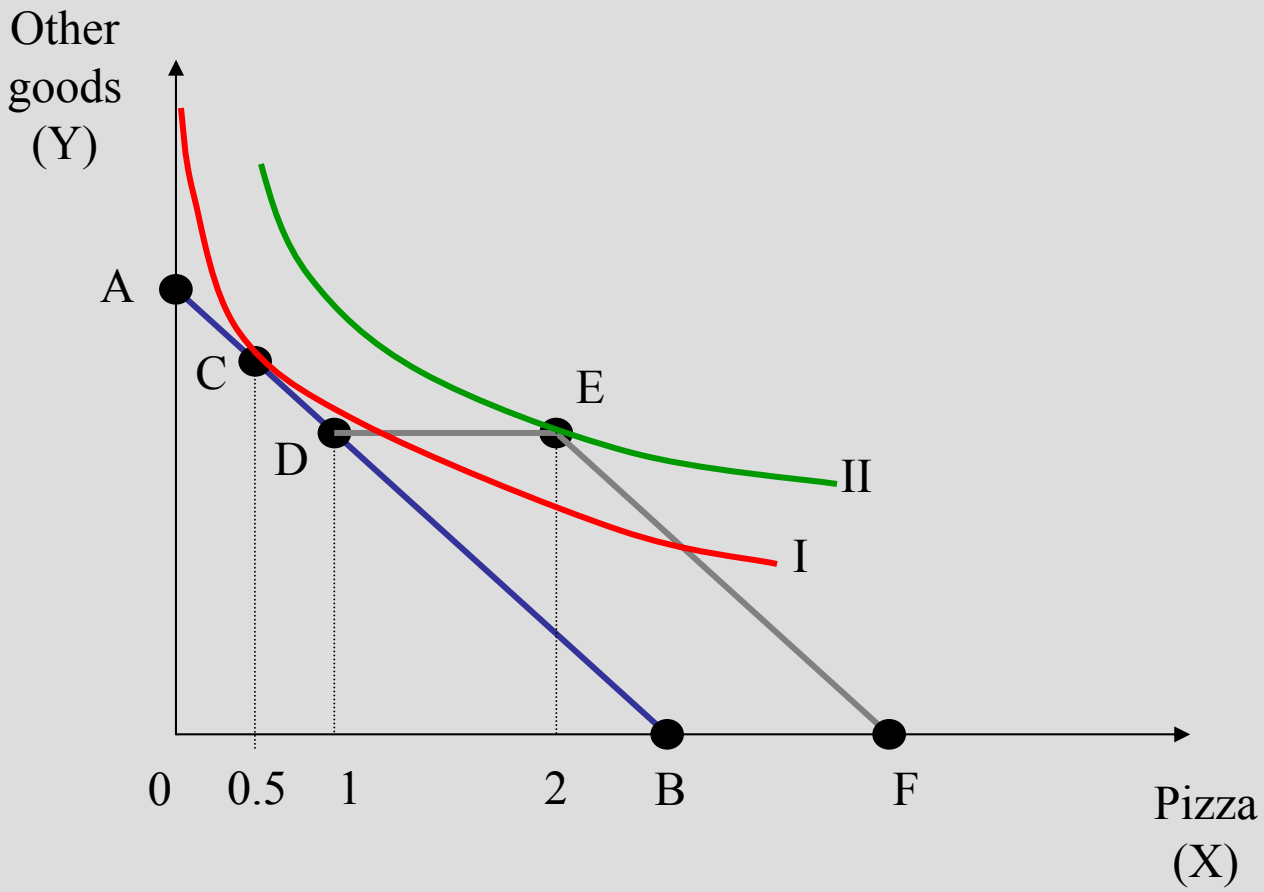
A Classic Marketing Application

A buy-one, get-one free pizza deal.



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Conclusion

- Indifference curve properties reveal information about consumers' preferences between bundles of goods.
  - Completeness.
  - More is better.
  - Diminishing marginal rate of substitution.
  - Transitivity.
- Indifference curves along with price changes determine individuals' demand curves.
- Market demand is the horizontal summation of individuals' demands.