Chapter 2: Part I
Consumer Behaviour and Market Demand

Objective: To determine the _______ demand function by building a **model** that focuses on the behaviour of the individual consumer. In particular, we will explore how the consumer achieves maximum satisfaction given his or her tastes, the prices of goods and the _______ of the consumer.

(I) **Consumer Preferences**:

(A) Indifference Curves

(B) MRS

(II) **<u>Budget Constraint</u>**

(A) Attainable Baskets

(B) Shifts

(III) **<u>Consumption Decision</u>**

(A) Maximum s____________

(B) Specialization

(IV) **<u>The Market Demand Function</u>**

(A) Consumer's ______ function

(B) Aggregating the demand functions

(V) **<u>Substitutes and Complements</u>**

Building the Consumer Behaviour Model

Definition: A **market basket**: specifies the q________ of different goods consumed per unit of time.

Assumptions About Consumer Behaviour:

(1) C____________

-A consumer is able to "____" market baskets:

-prefer Basket A to Basket B

-prefer Basket B to Basket A

-indifferent between Basket A and Basket B

Ability to rank market basket solely on the basis of the consumer's own satisfaction.

(2) C__________:

The consumer is consistent with his or her preference ________.

- ▷ Preferences are stable.
- ▷ T_____ are assumed not to change.

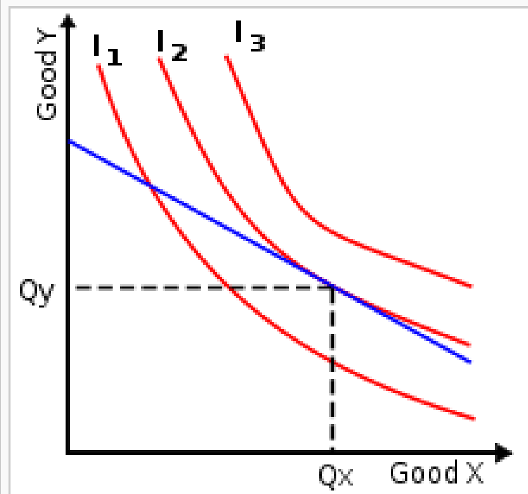
(3) T___________:

▷Eliminates contradictions in the consumer's preference ordering.

If the consumer prefers Basket A to Basket B, and prefers Basket B to Basket C, then, the consumer will prefer Basket A to Basket C.

(4) Non__________:

- More is __________ to less.
- The consumer is assumed to prefer ____ of any good.
- The ____ of a good the consumer can consume, the higher the level of satisfaction and well-being.



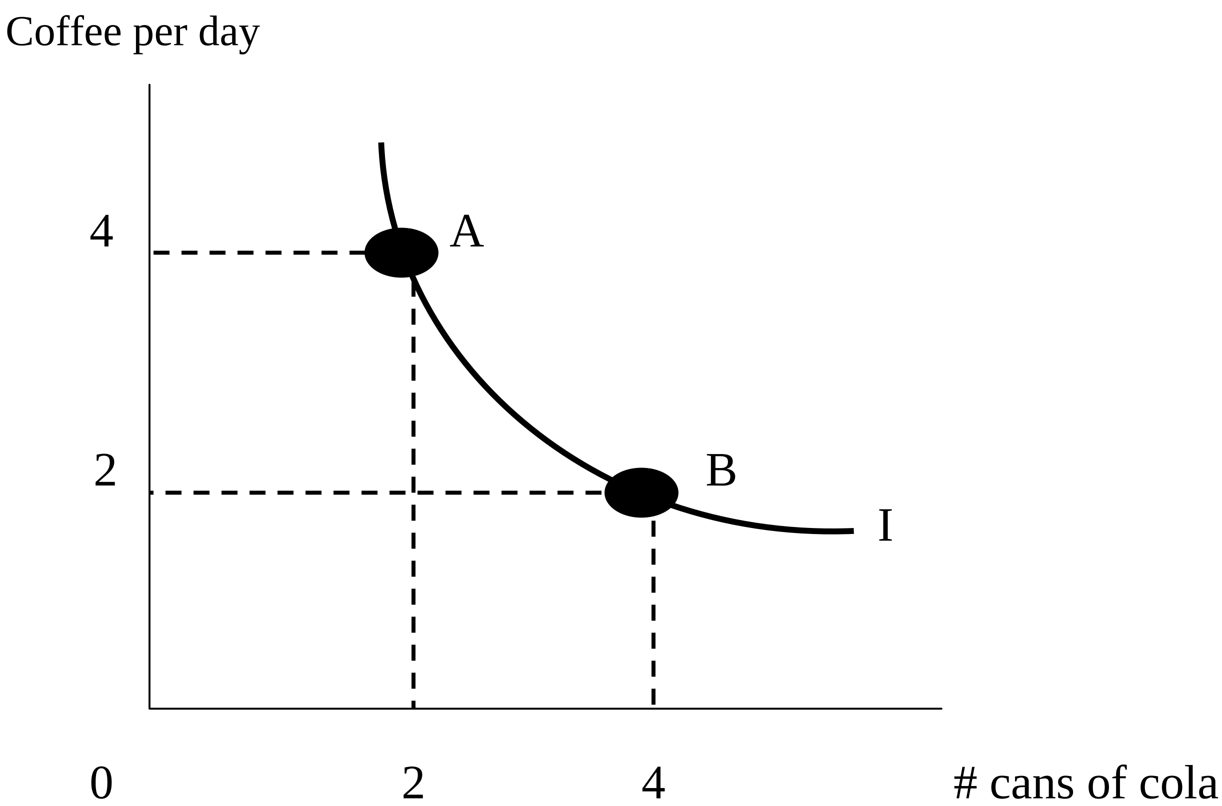
To maximise utility, a household should consume at (Qx, Qy). Assuming it does, a full demand schedule can be deduced as the price of one good fluctuates.

Describing Consumer Preferences: **Indifference Curves**

The consumer's preferences can be illustrated with the aid of **indifference curve** analysis.

An **indifference curve** represents a ***set*** of market baskets where the ________ derived from each basket of goods is the **same** no matter which basket is consumed.

The consumer is ________ satisfied by any basket in the set.



The consumer will attain the ______amount of satisfaction from consuming basket A or B.

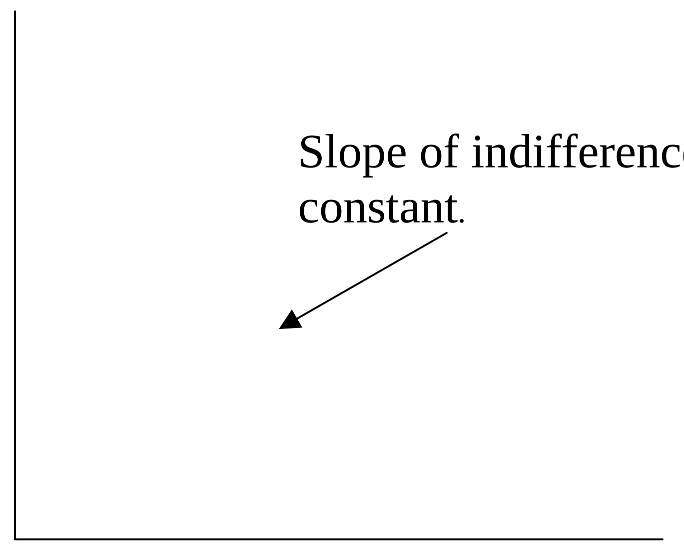
Actually, the consumer will be indifferent between consuming any combination of Coke and coffee along the indifference curve.

The idea of an indifference curve is that it illustrates the notion of how willing a consumer is to ___________ one good for another and still remain in__________.

The shapes of indifference curves differ from one **individual** to another.

There are two extreme cases of indifference curves:

(1) **The S________ Line Indifference Curve**:



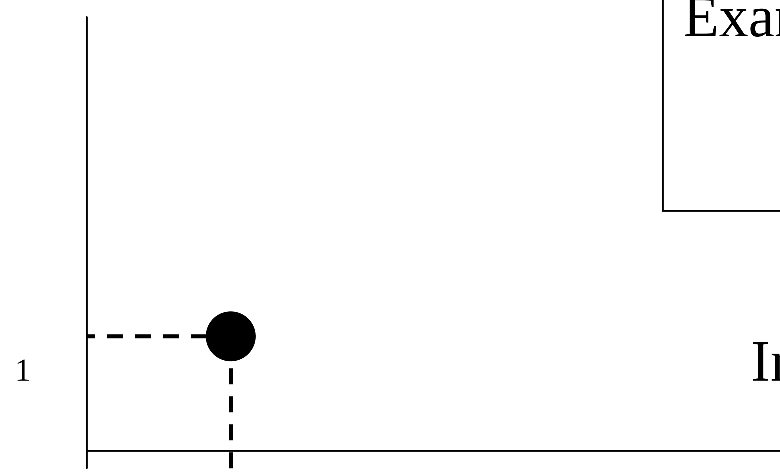
The consumer substitutes one good for another at a _________ rate, irrespective of how many units of each good are consumed.
The two goods are considered **perfect substitutes** in this case.

Examples: brand versus no-name products
Long-distance phone companies
Gasoline stations

(2) The L-S______ Indifference Curve:

Two goods must be consumed together in the same fixed proportion.

The two goods are considered **perfect ____________.**



Examples: Shoes: right and left
Skates: right and left
Gloves: right and left

Most indifference curves are shaped somewhere in-between these two extremes.

The Marginal Rate of Substitution

At any point along the indifference curve, the ______ of the indifference curve is called the **marginal rate of substitution** (MRS).

The MRS illustrates the consumer’s trade-off between the two goods that keeps the consumer’s________ constant.

MRS is n________.

It numerically indicates how much of one good the consumer is willing to give up for a given increase in another good.

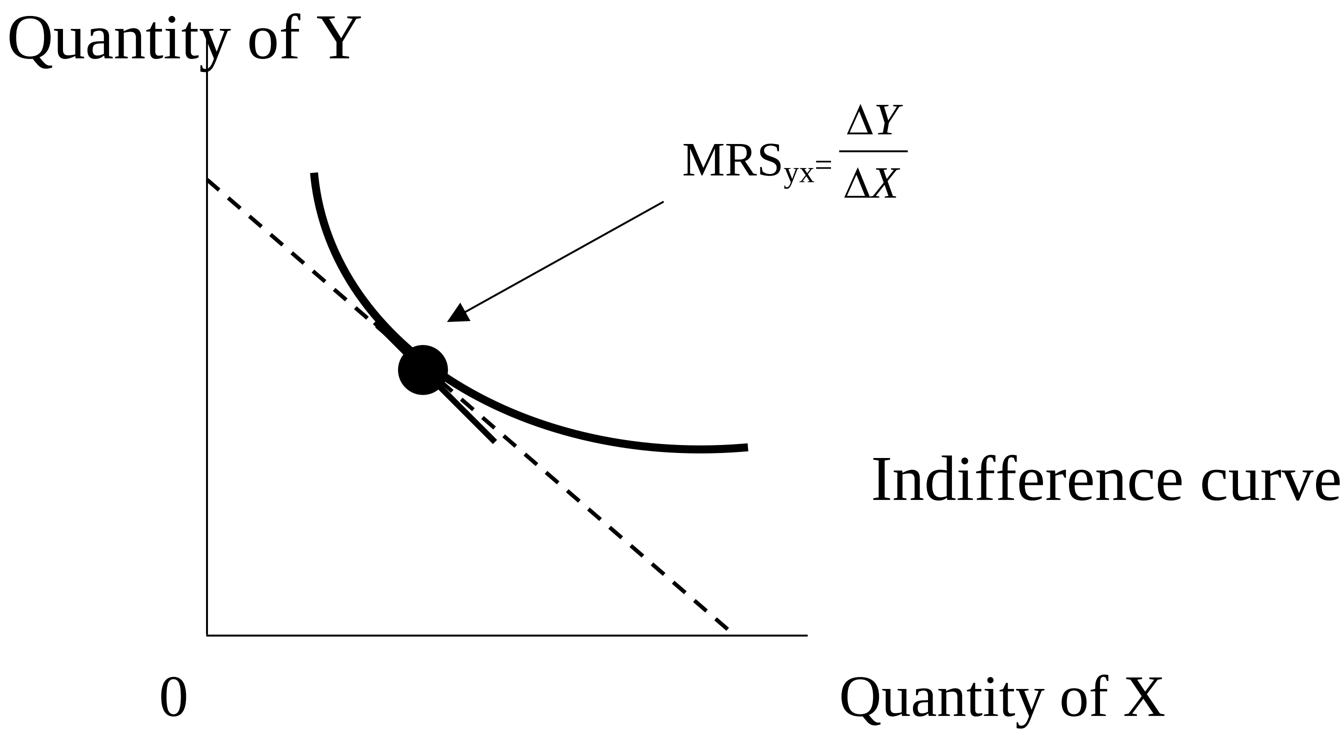
Algebraically:

$$\mathrm{MRS}_{\mathrm{YX}} = \left.\frac{\Delta Y}{\Delta X}\right|_{\mathrm{U=constant}} \quad \text{(Marginal Rate of Substitution)}$$

Generally, as one moves horizontally along the indifference curve, the slope of the curve becomes ________.

Numerically, the slope becomes larger (i.e. a smaller negative number.)

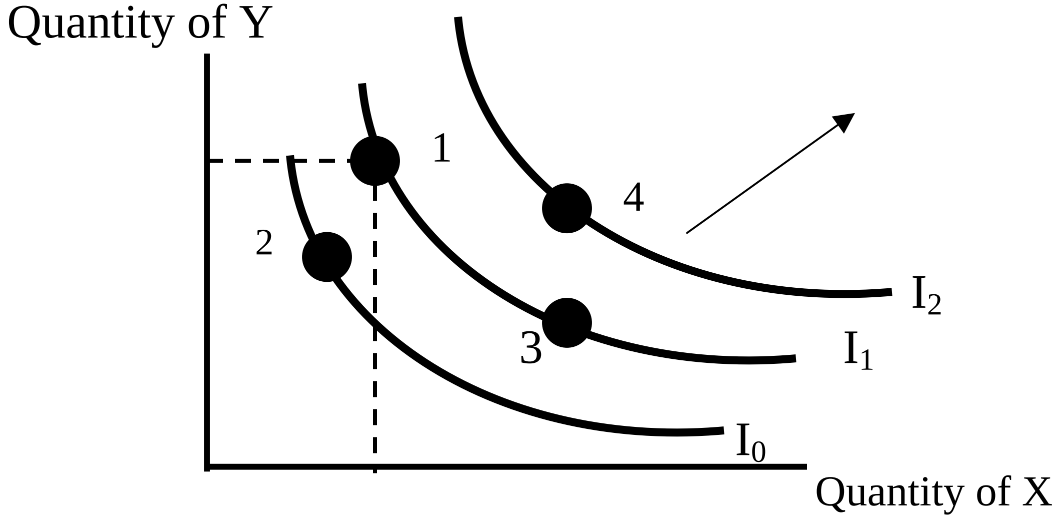
Hence, the *typical* indifference curve exhibits a diminishing rate of substitution.



Quantity of Y
MRS$_{yx}$= $\frac{\Delta Y}{\Delta X}$
Indifference curve
0
Quantity of X

Indifference Maps

An indifference map contains all of the indifference curves of a ________.
Every market basket is on one of these curves.



$I_0 < I_1 < I_2$

In the diagram above, we have three of several indifference curves for an individual consumer.

Basket 1 provides more utility than Basket 2 because it is located on a higher indifference curve. ($I_0<I_1<I_2$)

Basket 1 and 3 provide the same level of satisfaction, because they are both located on the same indifference curve.

Basket 4 provides the highest level of utility.

Any market basket on an indifference curve __________ of another indifference curve will be preferred.

The consumer must be able to **r___** the market baskets to create an indifference map.

By assigning utility numbers to each market basket, each basket on the same indifference curve would have the same utility number.

Of course, larger numbers would be assigned to market baskets on higher indifference curves.

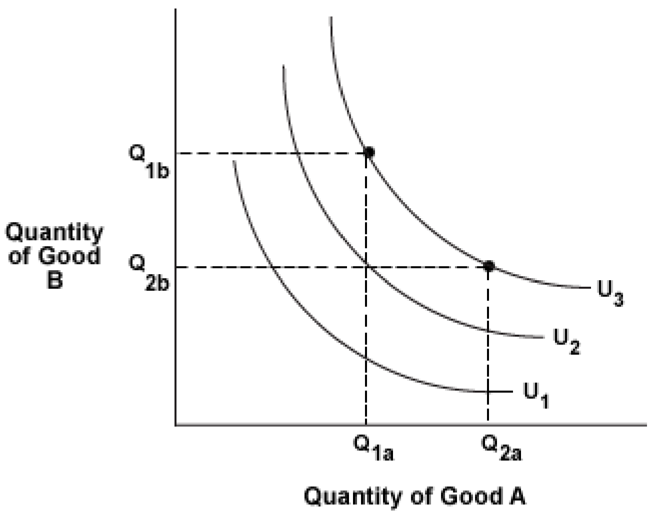
To summarize the consumption preferences of the consumer, a utility function illustrates the relationship between the quantity consumed of each good and the utility number:

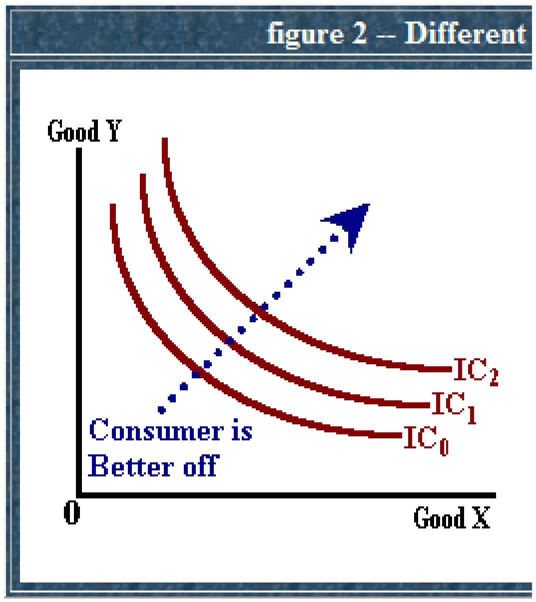
$U=U(X,Y)$ Utility Function

The function expresses the consumer's utility as a function of the quantities of each _____consumed.

Properties of Indifference Curves

1) The ______ of an indifference curve must be negative.
2) Indifference curves never _______.
3) C______ to the origin
4) Higher curves preferred





Budget Constraint

Consumers cannot **afford** all the goods and services they desire.
Consumers are limited by their i_____ and the **prices** of goods.

Model Assumption: Consumers spend **all** their income (no savings)

Let:

M=Income
X and Y are two goods
P_x=price of each unit of good X
P_y = price of each unit of good Y

Budget constraint: numerical expression of which market baskets the consumer can afford.

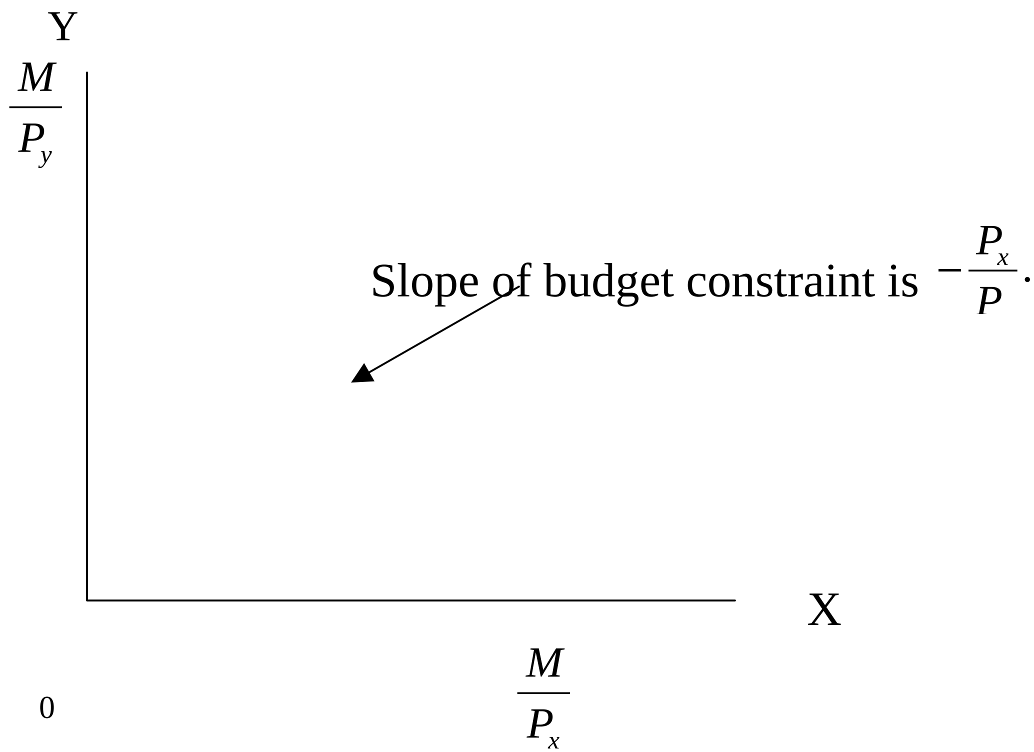
The Budget Constraint: $P_x X + P_y Y = M$

Total expenditure = Income

Rearranging the above expression for the budget constraint, we are able to determine how many units of good Y we can consume for any given quantity of good X:

$$Y = \frac{M}{P_Y} - \frac{P_X}{P_Y} X$$

This equation of a straight line illustrates the _____-___ between Y and X.



Dividing I______ by the price of Y yields the maximum number of units of Y that can be purchased when no units of X are purchased.

Dividing income by the price of X yields the maximum number of units of X that can be purchased, when no units of Y are purchased.

These are the intercepts of the budget line.

The slope of the equation $-\frac{P_X}{P_Y}$ is ________because in order to purchase more units of Y, the consumer must give up units of X.

Shifts in the Budget Constraint

What happens to the budget constraint when: (1) income changes, (2) the price of X changes or (3) the price of Y changes?

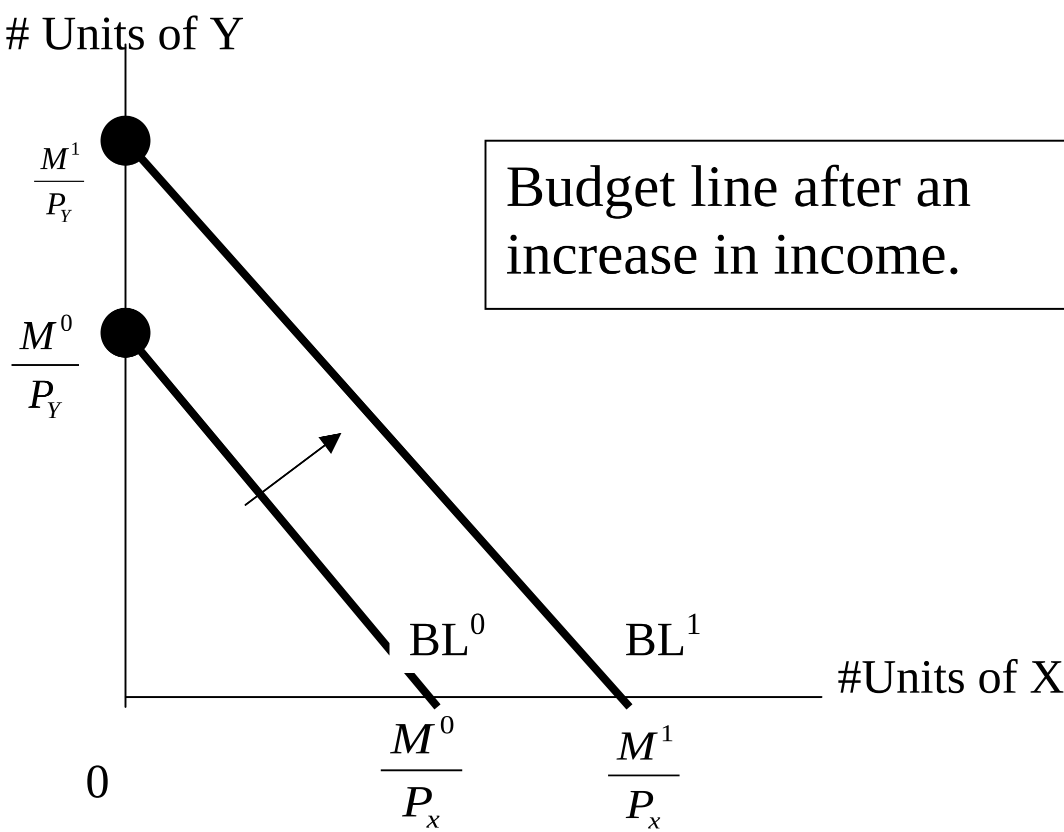
1) I______ changes

Let M^0= initial income
M^1=new income

When income changes, the Y intercept changes from $\frac{M^0}{P_Y}$ to $\frac{M^1}{P_Y}$ and the X intercept changes from $\frac{I^0}{P_X}$ to $\frac{I^1}{P_X}$.

The slope of the budget line remains unchanged at $-\frac{P_X}{P_Y}$.

Hence, a change in income is shown as a **parallel shift** inward or outward of the budget constraint.

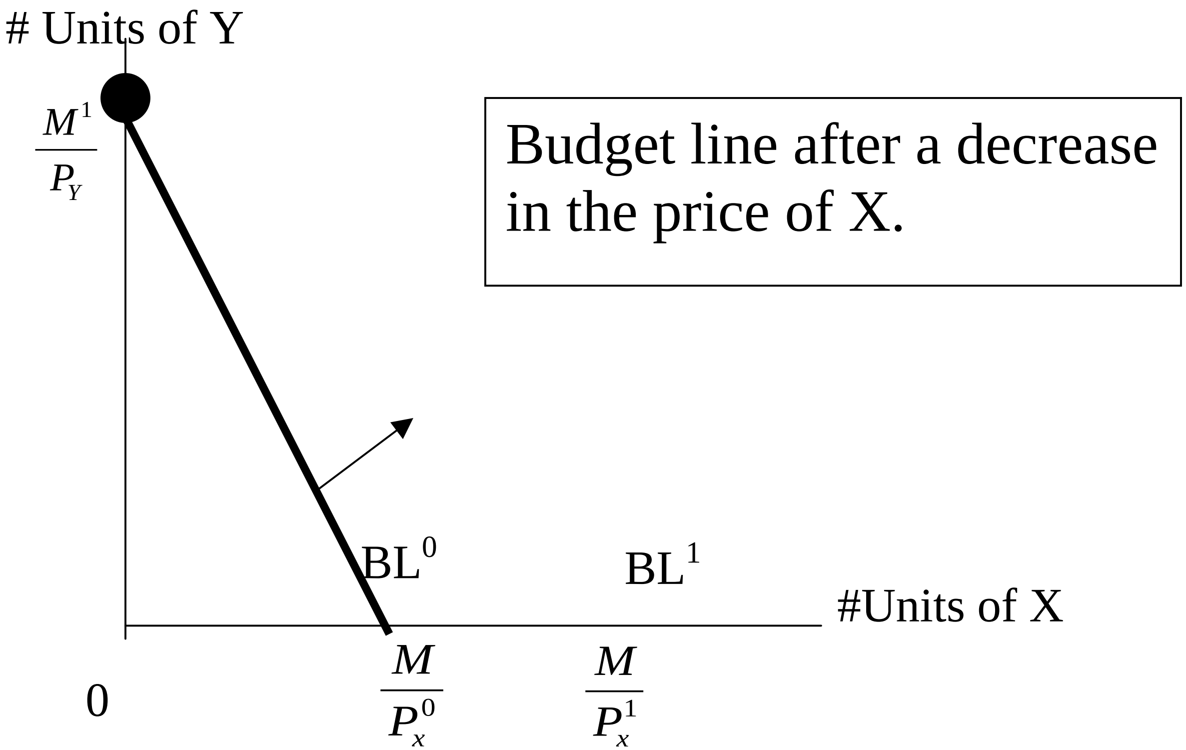


(2) A change in the p_____ of good X:

A change in the price of good X does not change the amount of good Y the consumer could buy if he or she spent all their income on Y. (i.e. the intercept remains the same.)

The _______ line **does** change:

- ▷For price increases, the budget line becomes steeper
- ▷For price decreases, the budget line becomes flatter.



Let P_X^0 = the initial price of good X.
Let P_X^1 = the new (lower) price of X.

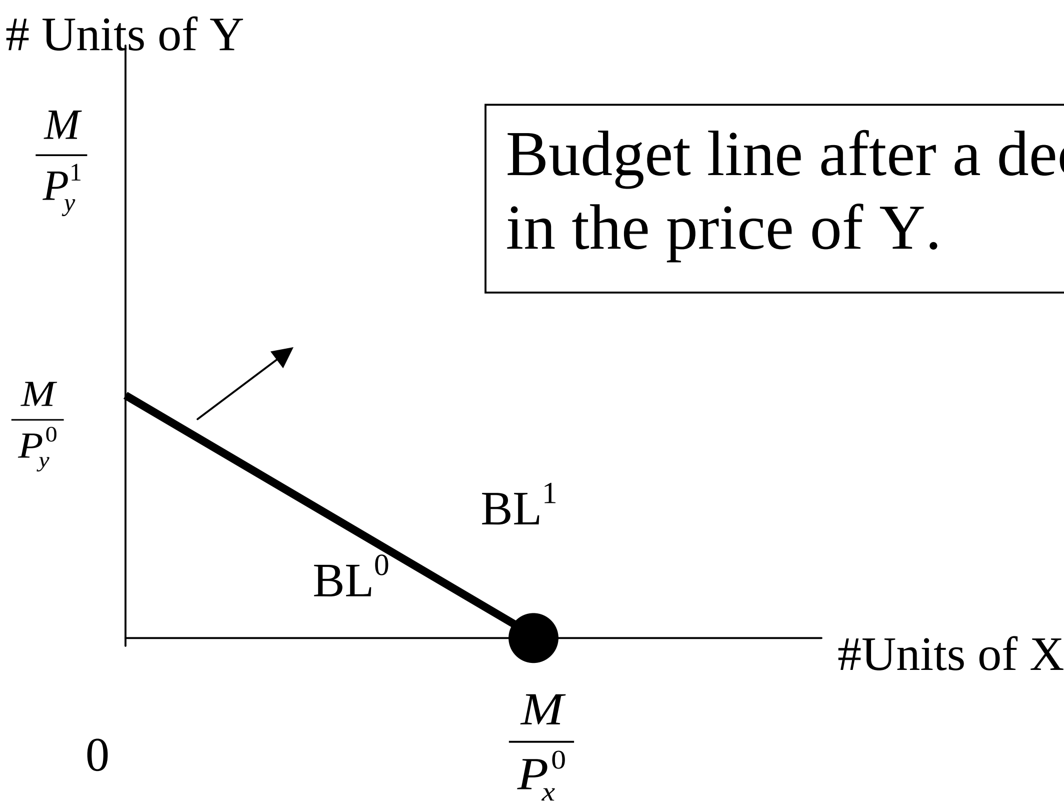
When the price of X decreases, the consumer can now purchase more of good X.
▷The budget constraint swings outward and becomes flatter.

(3) A Change in the ______ of Good Y:

A change in the price of good Y does not change the amount of X the consumer could buy if he or she spent all their income on X. (I.e. the X intercept remains the same.)

However, the budget line does change:

- ▷For price increases the budget constraint becomes ________.
- ▷For price decreases the budget constraint becomes steeper. (I.e. the Y intercept increases.)



Let P_Y^0 = the initial price of good Y.

Let P_Y^1 =the new (lower) price of Y.

<u>Note:</u> If all prices and income change by the same proportion, the budget constraint is ___________.

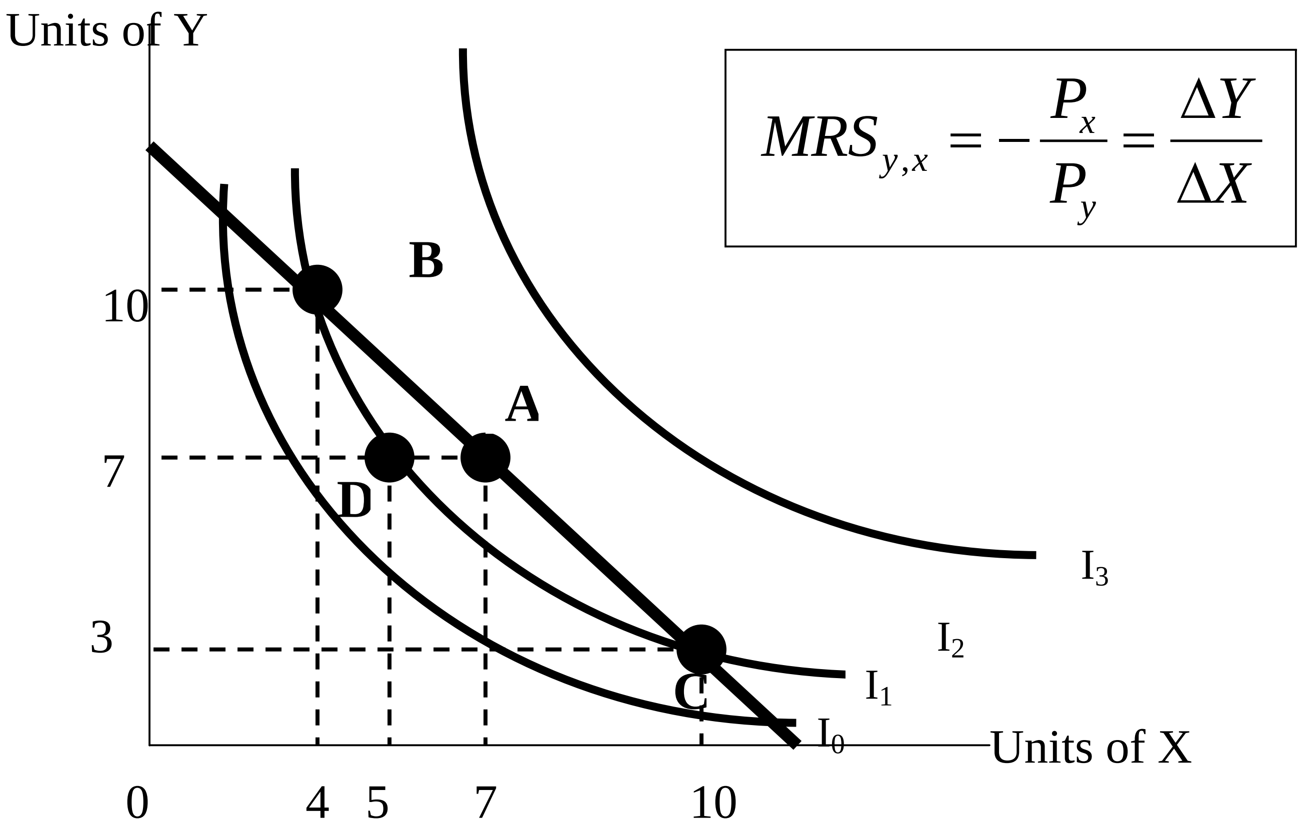
The Consumption Decision:

The objective of the consumer is to maximize _____________ subject to his or her ______ (income) constraint. We must bring together the concepts of budget constraint and preference to determine the consumer's consumption decision.

That is, the basket of goods the consumer eventually purchases is determined by individual taste and afford ability.

We know that all market baskets on the budget constraint are attainable because they are affordable. The consumer will choose the basket of goods that is on his or her highest attainable _____________ curve.

Graphically we have the following:



The consumer maximizes utility at market basket A, where the MRS equals the _____ of the budget constraint.

A necessary condition for the consumer to maximize utility subject to the budget constraint is:

$$\boxed{---_{YX} = -\frac{P_X}{P_Y}}$$

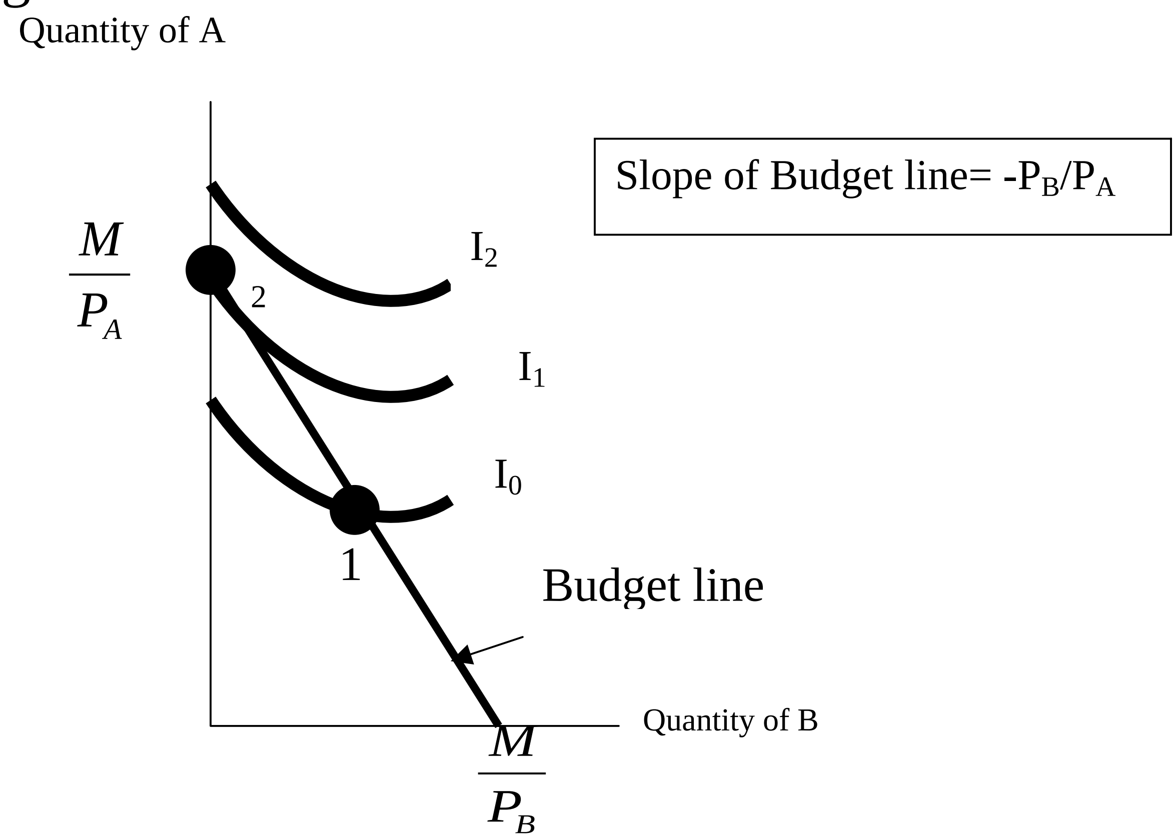
The consumer divides total income between the two goods so that the MRS between the two goods equals the negative of the price ratio, which equals the ______ of the budget constraint.

"When selecting a market basket containing both goods, a consumer maximizes utility by equating his or her marginal rate of substitution with the market's marginal rate of substitution."

Generally, most baskets contain "____" goods, but there are situations where the consumer only consumes one of the goods:

<u>Specialization of Consumption: C_____ Solutions:</u>

We can apply this model to explain why consumers do not purchase certain goods.



This consumer maximizes utility by consuming market basket '2' on indifference curve I1. The consumer chooses to not consume any of good B. It is the tastes of the consumer that determines the market basket. This solution is referred to as a corner solution. This market basket illustrates the concept of specialization of consumption. The consumer does not purchase any of Good B because the MRS is greater than the slope of the budget line when he / she selects market basket 2.

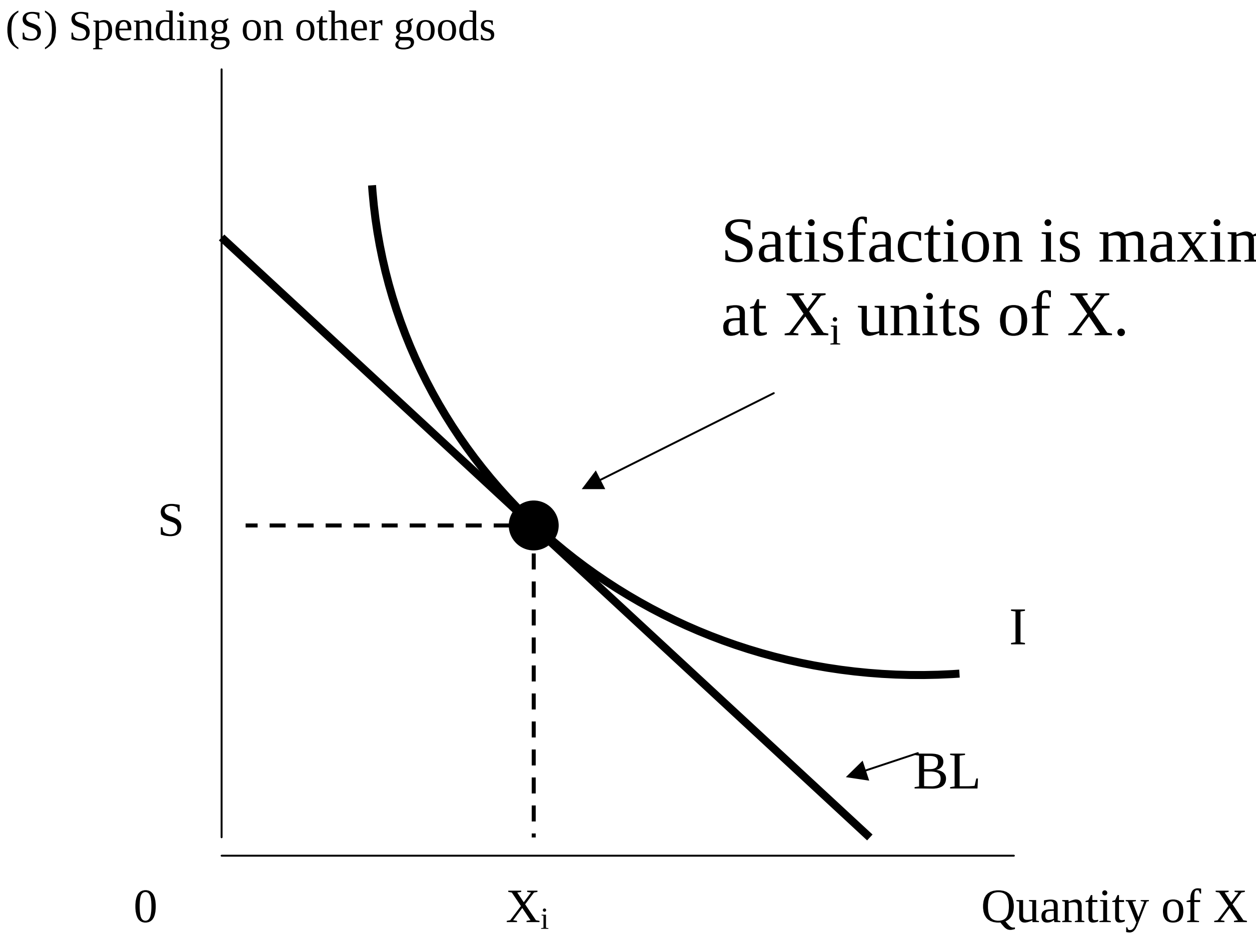
Introduction of A C________ Good

In order to extend the consumer behaviour theory to include all goods consumed by a consumer, we introduce a composite good such that we can still illustrate consumer behaviour with a **two** dimensional graph.

Assume the consumer consumes ‘n’ goods.

A composite good is defined as the number of _______ spent on the other (n-1) goods.

The two goods in the consumer’s utility function becomes units of good ‘X’ and units of ‘S’, the total spending on all goods other than ‘X’.


(S) Spending on other goods
Satisfaction is maximized
at X_i units of X.
S
I
BL
0
X_i
Quantity of X

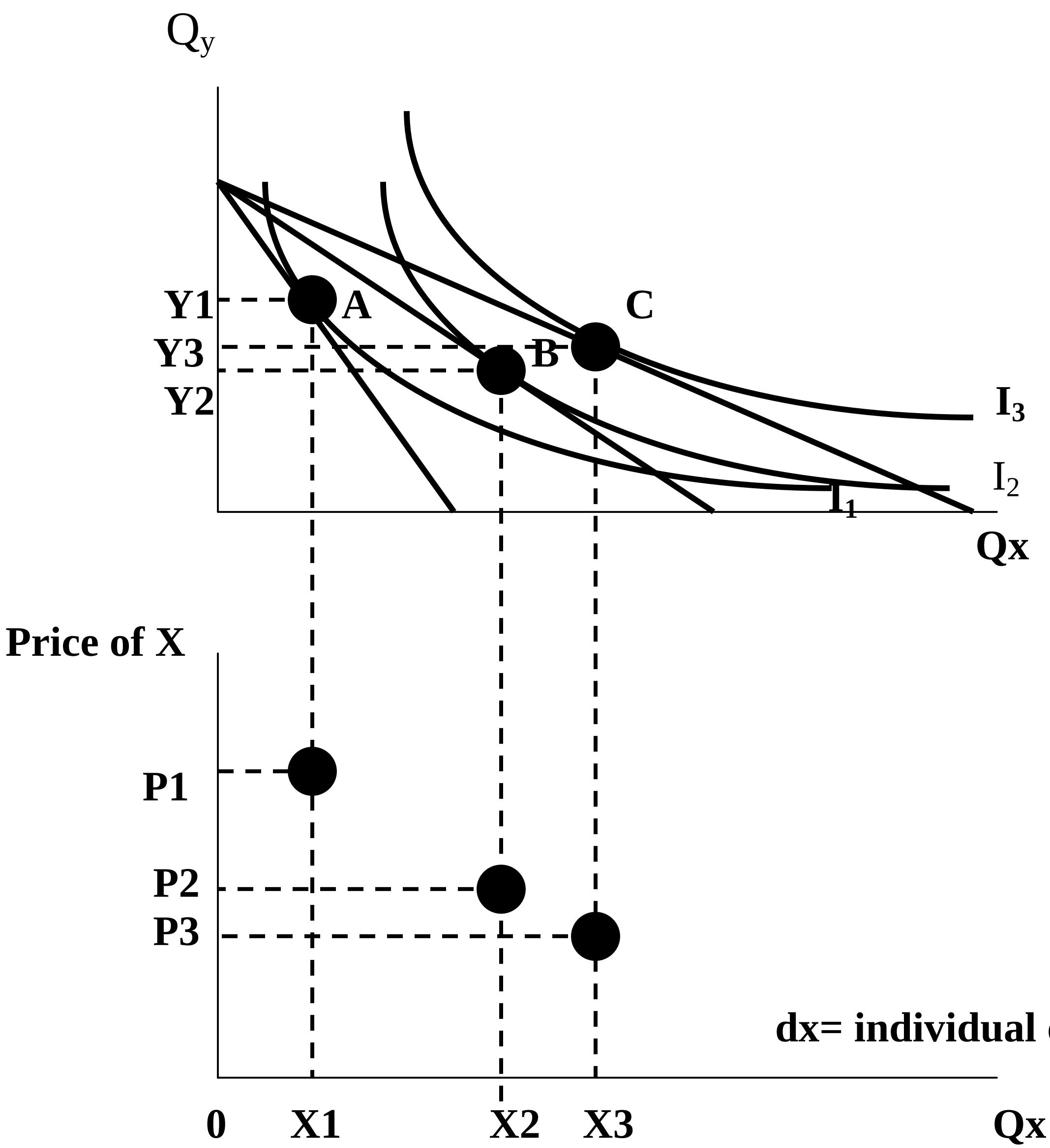
The M______ Demand Function

To derive the market demand function, we will use the ______ maximization model of consumer behaviour to determine each consumer's demand function for a good.

The Consumer's Demand Function

Assume: the consumer's income is ______
two goods, X and Y
price of Y is fixed

- As the price of X decreases, the budget constraint rotates.
- The consumer purchases different baskets to maximize utility.
- The demand curve for good X is **derived** as the price of X changes.



dx= individual demand

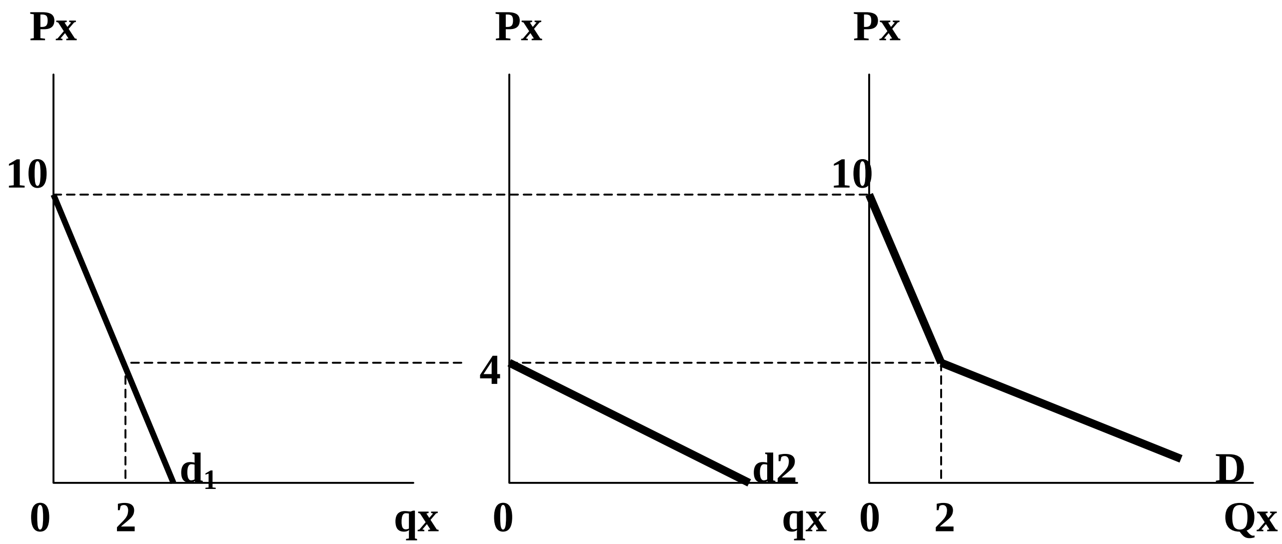
The Market Demand Function

The market demand function represents the **total quantity** of a good demanded by **all** individuals at each _____.

It is derived by horizontally summing up the demand curve of each consumer.

For each price, the quantity demanded by each consumer is added up horizontally to derive the total quantity demanded in the ______.

Individual demand curves differ because income and p__________ differ across consumers.


Px
10
2
0
qx
d1
Px
4
0
qx
d2
Px
10
0
2
Qx
D

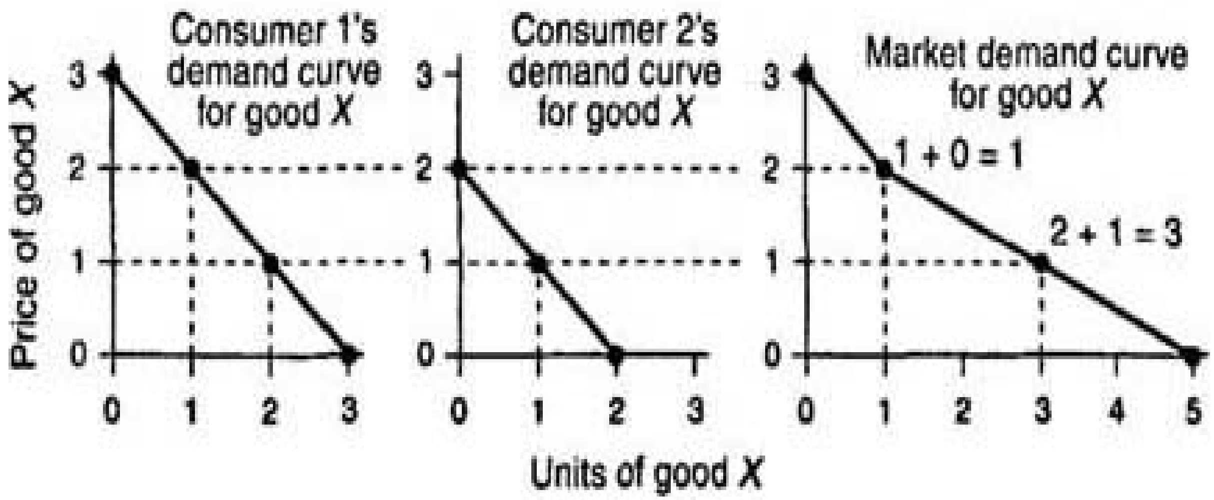
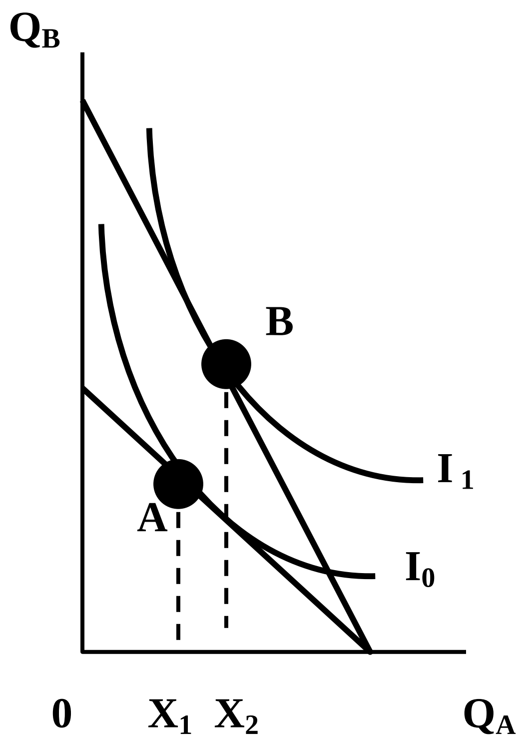


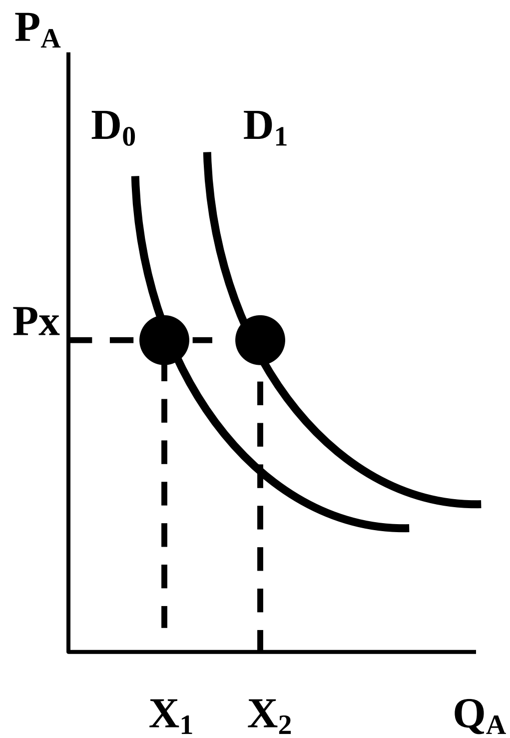
Figure 1

Derivation of the market demand curve from consumers' individual demand curves

Substitutes and Complements

When the price of a good changes and the quantity demanded of another good changes in the ________ direction, with the price of the other good held constant, the two goods are referred as ___________**goods**.

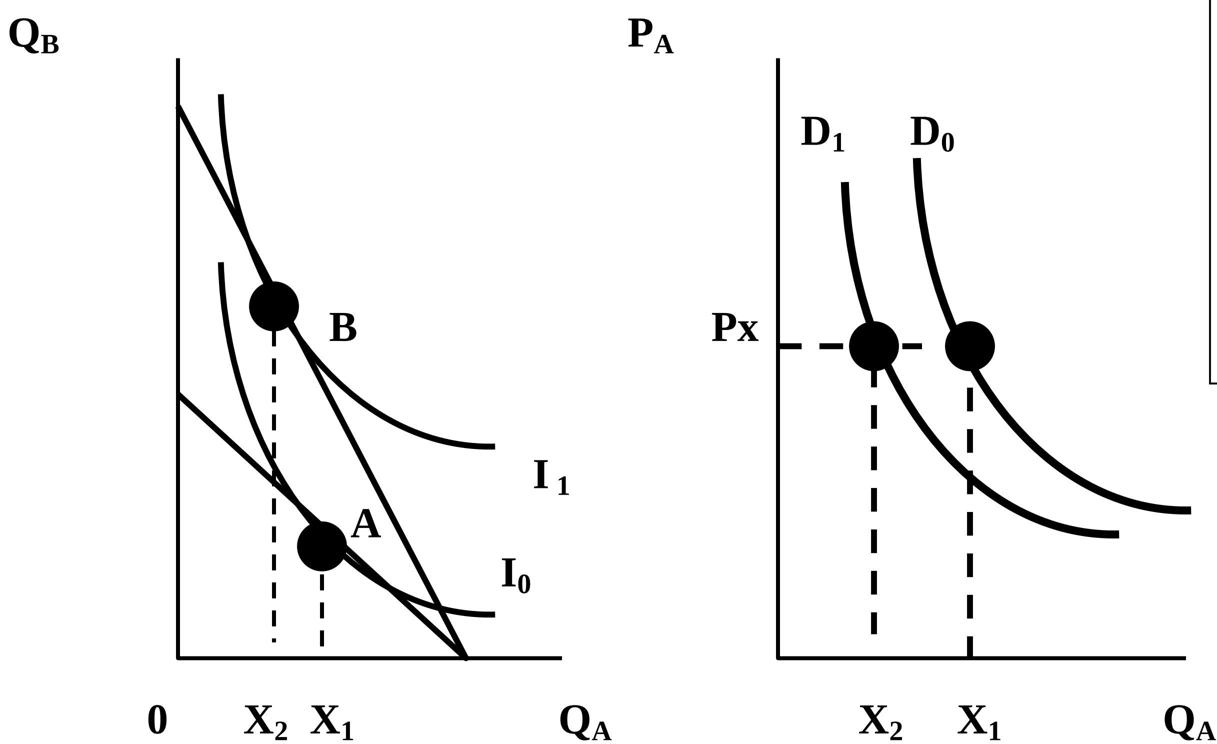




Examples:
▷Tennis balls and tennis rackets.
▷Printers & paper
▷Gas and cars

Demand for good A increases due to a decrease in the price of B.

When the price of a good changes and the quantity demanded of another good changes in the ____ direction, with the price of the other good held constant, the two goods are referred as **<u>s________ goods.</u>**



Examples:
⇨IBM computers and Dell computers
⇨Sony TV and Sanyo TV
⇨Coke versus RC

We can determine whether two goods are substitutes or complements by the ____ of the **arc cross-price elasticity of demand**.

The arc cross-price elasticity of demand measures the average percentage change in the quantity of one good relative to the average percentage change in the _____ of another.

If we have two goods A and B, the arc cross-price elasticity of demand is:

$$E_{BP_A} = \frac{\Delta B}{\Delta P_A} \bullet \frac{P_A^1 + P_A^2}{B_1 + B_2}$$

The only difference with this equation with the arc price elasticity of demand is that the change in the quantity of A has been replaced by the change in the quantity of B, and the sum of the units of A by the sum of the units of B.

The arc cross-price elasticity of demand measures the response of B to a change in the ______ of A.

If A and B are _____________, then $\frac{\Delta B}{\Delta P_A}$ is _______ and the arc cross price elasticity of demand is **negative**.

If A and B are _____________, then $\frac{\Delta B}{\Delta P_A}$ is positive and the arc cross price elasticity of demand is **positive**.