



WELCOME

Lecture# 2

Date: 24th March, 2022

Constant:

A constant is a quantity which remains unchanged during any mathematical operations or any investigation.

There are two types of constants

i) Arbitrary constants

ii) Absolute constants

Arbitrary constant:

Quantities which have the same value under one investigation but are different for different investigation are called arbitrary constant.

Example: The equation of the straight line $x\cos\alpha + y\sin\alpha = p$

Absolute constant:

Thus quantities which have the same value under all circumstances are called absolute constant.

Example: 1 , 5, 9, 10

N.B. In computer programming, a constant is a value that can not be altered by the program during normal execution.

Variable:

A variable is a quantity that may change within the context of a mathematical operations.

Generally, we use the letters x, y, z, u, t etc. for variables.

Or

A quantity that can change or that may take on different values.

There are two types of variables:

- i) Independent variables
- ii) Dependent variables

Independent variable:

A variable in an equation that may have its value freely chosen without considering Values of any other variable.

OR

A variable which may take any arbitrary value assigned to it is called an independent variable.

For equation $y = 3x - 2$, the independent variable is x . The variable y is not independent Since it depends on the number chosen for x .

Dependent variable:

A variable that depends on one or more other variables. For equation such as $y = 3x - 2$, the Dependent variable is y .

FUNCTION

Definition(In terms of variable)

If a variable y depends on a variable x in such a way that each value of x determines Exactly one value of y , then we say that y is a function of x .

e.g. $y = x^2 + 2x + 2$ or $f(x) = x^2 + 2x + 2$

Definition(In terms of sets)

Suppose that we have two non empty sets X, Y and a rule f establishing a correspondence between the numbers of X and Y . If the rule f is such that it assigns to each element $x \in X$ a unique element $y \in Y$, then f is called a function.

It is denoted by $f: X \rightarrow Y$ and read as f is a function of X to Y .

We also express this as $f: x \rightarrow y$ or $y = f(x)$