Friction

November 15, 2015

Praveen Fernando

1 Mathematical Induction

Apart from normal methods that we are using to solve **mathematical equations or expressions** there exists some other methods.

Mathematical Induction can be used as a method to show that a mathematical expression or a equation is true for all the positive integer $\mathbb{R}^+$ values.

In this chapter we are comprehensively studying **mathematical induction and it's uses**.

Now let us consider the below mentioned example.

Let$(\mathbf{xy})^{\mathbf{n}} = \mathbf{x^n y^n}$ **be a mathematical expression which can be represented by** $\mathbf{P_n}$ **where n** $\in \mathbb{R}^+$.Here x and y are real numbers.

Hence,

when n=1; $(xy)^1 = xy$ *is represented by* P_1

when n=2; $(xy)^2 = x^2y^2$ *is represented by* P_2

when n=3; $(xy)^3 = x^3y^3$ *is represented by* P_3

.....

From general understanding of multiplication and power rules for real numbers, it's obvious tha the above P_1, P_2, P_3 are true.But for all infinite number of n we can't prove that P_n from the above method.Therefore **mathematical induction** can be used in such circumstances.

2 Mathematical Induction Concept

Let us consider an expression consists of the n variable which can be represented by P_n.Now let us consider the folllowing points.

i)P_1 is true in the above statement.

ii)When k is a positive integer, if $P_k$is true then P_{k+1} is also true.This can be written as $P_k \Longrightarrow P_{k+1}$