The Variables

by Manjil Saikia - Sunday, December 18, 2011

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Mathematics deals with situations in everyday life . The situations are, however, varied in nature.

We come across instances of unknown or variable quantities in the course of the day. For example, when we travel in a bus, the speed of the bus keeps on changing; the number of passengers changes at every stop; and the amount in the purse of the bus conductor also keeps on changing. In fact, life is full of variable quantities. The monthly expenditure of a person, the profit earned in a business, the yield of a crop, the yearly rainfall, the temperature of air, the length of a day are all variable quantities.

The Hindu mathematicians were the first to recognize the need for denoting unknown or the variables and used a different notation for them. The world yavattavat, meaning 'as much' or 'as many', was used to denote an unknown quantity in a manuscript dating back to the period well before 300 B.C. Later mathematicians used the word avyakt, meaning 'an unknown quantity' (as against vyakt which denotes a known quantity) instead of yavattavat.

Recent discoveries have shown that Babylonians solved problems in variables although they had no symbols for them. They used only words to denote such numbers, and that is why algebra has been referred to as rhetorical algebra. The papyrus, an Egyptian scroll going back to 1600 B.C., has a number of problems in algebra, in which the unknown is reffered to as a hau, meaning 'a heap'.

Aryabhatta I, Brahmagupta and Bhaskaracharya II were some the eminent ancient Hindu mathematicians who propounded and perfected the methods of beejganita, 'the mathematics of letters'.

Little further progress was made in this fielduntil we came to Diophantus, a Greek mathematician living in the third century A.D. He reduced problems to equations, representing the unknown quality by a symbol suggesting the Greek ?? (sigma). He also introduced an interesting system of abbreviations in which he used only the initial letters of words and omitted all unnecessary words. In the sixteenth century, Francois Vieta, a French mathematician, used the vowels a,e,i,o,u to represent unknown numbers and the consonants b,c,d,f,g and so on to stand for values that remained fixed throughout a given problem. Rene Descartes, the great sixteenth century French philosopher, proposed the system of a,b,c and other letters to denote variables or unknown quantities in a problem was the first step towards generalization of the basic concepts of arithmeticand the key to the progress of mathematics.

The word 'algebra' originated from the title of a work on algebra by a Persian, Mohammed ibn Mesa al Kwarizmi who lived in ninth century A.D. He wrote in Arabic a work called Aljebr w'al Muqabala, which means 'restoration and reduction'. By aljebr, or restoration, was meant transposing of negative terms to the other side of an equation to make them positive. When Arabs came to Spain, tehy brought this word with them. In the course of time aljebr got changed into 'algebra', and the word came to be applied not to a single operation, but to many operations involved in algebra.

[This article is contributed by Bishal Deb, a 10th standard student of Carmel School, Digboi. Bishal is very enthusiastic about mathematics and hopes to pursue a research career in mathematics.]
