Brahmagupta Biography

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Contents

Biography

Brahmagupta was an Indian astronomer and mathematician. He was the head of the astronomical observatory at Ujjain (his probable birthplace). His main, but not sole, achievements in the field of mathematics were the introduction of **zero** and **negative numbers**.

Brahmagupta wrote two main texts, both of which deal with **arithmetic** and astronomy. His first work in 628 was *Brahmasphuta siddhanta* (The Opening of the Universe), and in 665 he published *Khandakhadyaka*. Both of these texts are actually written in verse. Mathematically these works include the first known use of negative numbers and a figure for zero as well as a formula for finding the **area** of a cyclic quadrilateral based on its sides (this is now known as Brahmagupta's formula; it is a modified form of **Hero's formula**). Also in his first book Brahmagupta solved the **Chinese remainder theorem**, which looks at simultaneous linear congruences, by a method different to that used by the Chinese. Brahmagupta also proposed several algebraic rules for solving quadratic and simultaneous **equations**. Other work by Brahmagupta included arithmetic progression and theorems relating to right **angle** triangles. The astronomy included in these books deals with planetary movement and eclipses. Brahmagupta lived in a time when it was thought that the sun and other planets revolved around the earth, but he was still able to give an accurate figure for the length of a year, 365 days 6 hours 5 minutes and 19 seconds (which he later revised to 365 days 6 hours 12 minutes and 36 seconds). We now regard the length of a year as being 365 days 5 hours and 48 minutes. Some of the work of **Bhaskara**, which was published some 500 years later, shows little advancement form that produced by Brahmagupta. It is true to say that Brahmagupta was the leading mathematician of the seventh century and that his work has had a massive influence throughout the centuries. Sometime in the eighth century the work of Brahmagupta was brought to Baghdad where it was translated into Arabic and then subsequently it was translated into Latin, at which point it spread throughout the western world.

Like many Indian mathematicians of this and later periods, Brahmagupta was producing work that was many centuries ahead of the equivalent work being carried out in the western world.