Logarithm Encyclopedia Article

Logarithm

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Logarithm

The invention of logarithms plays an important role in the history of mathematics. However, their use was also significant in the fields of science and astronomy, as well as in the development of the digital computer. The scientific explorations in the sixteenth century involved an ever increasing amount of numerical data. Mathematicians, astronomers, navigators, and scientists were forced to spend the majority of their days completing long tedious calculations. Around 1594 Scottish mathematician John Napier realized an improvement in calculation was needed, and he began to study different methods of representing numbers. Exactly how he stumbled across the concept of logarithms is not clearly known. Napier realized numbers could be more easily manipulated in terms of powers. Multiplication and division would then correspond to addition and subtraction of exponents. This innovative way of multiplying and dividing large numbers was a milestone event for mathematicians of the day. However, Napier had no concept of a base for a system of logarithms and his work was explained in geometric terms using proportions or ratios. Indeed, he coined the word logarithm from the two Greek words *logos* (ratio) and *arithmos* (number).

While Napier discovered the concept of logarithms in 1594, it was almost twenty years later, in 1614, before he was able to complete and publish his actual tables of logarithms in a Latin treatise called *Mirifici logarithmorum canonis descriptio* (*Description of the wonderful canon of logarithms*). The tables were put into use immediately and became an essential part of the mathematical, scientific and navigational processes. In 1615 English mathematician Henry Briggs, while impressed with Napier's discovery, suggested using 10 as a base, an idea Napier readily agreed with as it provided for more convenient use of the logarithms. The new versions of logarithms were referred to as Briggsian, or common logarithms. Briggs set about developing new logarithm tables, but overcome with exhaustion, terminated his work only partially completed in 1624. The Dutch bookseller and publisher Adrian Vlacq (1600-1667) took up the task of completing the Briggsian tables, which he completed to ten places in 1628. Logarithmic tables remained popular throughout the next several centuries, being utilized as the basis for many mechanical calculating devices.