Exponent Encyclopedia Article

Exponent

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Contents

Exponent Encyclopedia Article.....1

Contents.....2

Exponent.....3

Exponent

Exponential notation is a mathematical method of expressing extremely large or extremely small numbers. It takes the form of a symbol or number written to the right of and above another symbol or number to denote how many times the base number is to be multiplied by itself. For example: 2^3 is equal to 2 x 2 x 2.

The exponents may have been used as long ago as 1600 b.c. Babylonian tablets containing what are believed to be exponential tables have been discovered. It is hypothesized they were used by Babylonian moneylenders to calculate principal and interest payments, although whether this is actually true may never be known.

Exponential use was fairly common throughout Greek, Egyptian and Hindu mathematical history. Leonardo Fibonacci 's 1202 book Liber abaci, helped spread Hindu-Arabic calculation methods, which included the use of exponents, across Europe. In 1360, Nicole d'Oresme (ca. 1325-1382), a French teacher at the Parisian College of Navarre, wrote but never published, "Algorismus proportionum," which introduced notation and computation of fractional exponents. However, the use of fractional exponents did not become commonplace until the seventeenth century. Others who made use of exponential notation in their algebraic works were Nicolas Chuquet, Simon Stevin, and Rafael Bombelli (1526-1572), although their written notation methods differed. With John Napier's introduction of logarithms in 1614, addition and subtraction of exponents was used to easily accomplish multiplication and division. The discovery of logarithms and exponential calculation proved to be a turning point in mathematical history.

About 1665, René Descartes, through his work in geometry, algebra and calculus, introduced the concept of using numerical superscripts to designate the geometric ideas of squares, cubes, etc. Isaac Newton, another leading mathematician and physicist of the seventeenth century, used positive, negative, integral and fractional exponents in his equations. By the eighteenth century, the use of exponential notation became standardized into its present-day form.