Square Root Encyclopedia Article

Square Root

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The mathematical concept of square roots has been in existence for many thousands of years. A square root of a number can be defined as a number that when multiplied by itself produces the first number. For example, 2 is the square root of 4, 3 is the square root of 9. Exactly how the concept was discovered is not clearly known, but several different methods of exacting square roots were used by early mathematicians. Recently discovered Babylonian clay tablets from 1900 to 1600 b.c. contain the squares and cubes of the integers 1 to 30 in Babylonian base 60 Akkadian notation. Whole number roots were specifically stated, while irrational roots were expressed in surprisingly accurate approximations.

Egyptian papyrus dating from about 1700 b.c. have revealed that the Egyptians were knowledgeable of square roots, using a hieroglyphic symbol similar to ⌈ to denote square roots. By the Greek Classical Period (600 to 300 b.c.), square root operations were improved upon by the use of better arithmetic methods. However, because Greek mathematicians were unsettled by inharmonious phenomenon such as irrational numbers (e.g., the square root of 2 is 1.4142135...), they regarded geometry more highly than algebra and arithmetic for its elegance and harmony.

When Hindu mathematics became significant about a.d. 628, mathematicians accepted irrational numbers and used square root operations freely in their equations. They used the term *ka*, from the word *karana*, to denote a square root. Thus, *ka 9* would equal 3. Borrowing much from Hindu mathematics, Arabian mathematicians continued working with irrational number operations. It is the Middle Eastern mathematician al-Khwarizmi who developed our familiar term root to denote a solution to a problem. In the sixteenth century, the German mathematician Cristoff Rduolff was the first to use the square root symbol, , in his book *Coss*, written in 1525.