Mathematical 'Special' Functions

Mathematicians have, over the years, developed many different 'special' functions that have been found to be useful in solving mathematical problems or evaluating physical problems. Indeed, in a sense, the solution to 'any' mathematical equation can provide the opportunity to create a new 'special' function, as long as a large enough body within the mathematical community considers the solution to be sufficiently generic to be useful to describe as a 'special function'.

Thus, if we go back far enough in history standard trigonometric functions like $\sin(x)$ or $\cos(x)$, exponential and logarithmic functions like $\exp(x)$ or $\log(x)$ or even power functions like x^2 or $x^{1/2}$ might have been viewed as 'special' functions. Most of these more straightforward mathematical functions can be evaluated using no more than the standard built-in functions on a calculator or in a spreadsheet.

Nowadays, the term 'special' function is more usually reserved for more complex mathematical functions that are relevant in several different mathematical fields. The selection of which special functions are sufficiently worthy to be made available directly in a mathematical function library is thus somewhat arbitrary (and may also depend on how easy they are in practice to compute accurately).

Typically special functions take as their inputs real numbers, but in many cases they can also be evaluated for complex numbers. Some special functions take single inputs, others involve more than one input.

Further details of the 'special' mathematical functions supported by the Nematrian website are set out in 'special' mathematical functions that can be evaluated using the Nematrian website.

A particular class of 'special' functions are polynomials whose coefficients take specific values. Typically these are defined in the form of series of increasingly high order polynomials that then have specified characteristics relative to each other.