

## Unconventional Calculus Spreadsheet Functions

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**Abstract :** The spreadsheet engine is exploited via a non-conventional mechanism to enable novel worksheet solver functions for computational calculus. The solver functions bypass inherent restrictions on built-in math and user defined functions by taking variable formulas as a new type of argument while retaining purity and recursion properties. The enabling mechanism permits integration of numerical algorithms into worksheet functions for solving virtually any computational problem that can be modelled by formulas and variables. Several examples are presented for computing integrals, derivatives, and systems of differential-algebraic equations. Incorporation of the worksheet solver functions with the ubiquitous spreadsheet extend the utility of the latter as a powerful tool for computational mathematics.

**Keywords :** calculus, differential algebraic equations, solvers, spreadsheet

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