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A Boundary Quadrature Formula for Multivariate Integration

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A BOUNDARY QUADRATURE FORMULA
FOR MULTIVARIATE INTEGRATION

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There are many applications in which a desired integral is difficult or impossible to compute directly and furthermore all information about the function is limited to the boundary of the integral domain. In such cases we can approximate the value of the integral by using boundary quadratures.

In this project we put forward a dimensionality - reducing expansion with the highest possible algebraic accuracy and the smallest possible remainder estimation. By using this expansion, we may convert a complex integral of a high dimension to a summation of integrals of a lower dimension. We are then able to construct a boundary quadrature for each of these lower dimension integrals and thus find an approximate value for our original integral.