

## **Abstract**

High school students are taught algebraic methods for solving integrals, by finding an anti-derivative which can be done relatively easily. However, more often than not, an integrals anti-derivative is impossible to found or even express. Consequently, numerical methods must be applied to determine the values of the integrals. These methods approximate the areas by various approaches. In this study, a selection of six methods have been compared in their precision, convergence-rate, and effectiveness of evaluating three non-elementary integrals. The methods have been implemented into the programming language of Python. Measuring their elapsed time and their deviation from the exact values, the study found out that the Newton-Cotes methods required the least amount of time, whilst Gauss-Legendre had the best precision. Likewise, the study found a clear relationship between iterations, subintervals and the approximations, as they were inversely proportional. Additionally, it was deluded that the methods' exactitude depends on how well their procedures and area-fractions fit the diverse integrals.