

# Calculate the Riemann Sums using GeoGebra

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## **Abstract**

In the nineteenth century German mathematician Bernhard Riemann discovered a new method called Riemann sums, to find definite integral. This method gives approximate definite integral values. Moreover, these Riemann sums are used to find Riemann integrals. The values and the graphical representations of the calculated Riemann sums can be viewed using the open-source software GeoGebra. The most common types of Riemann sums: i) The left Riemann sum, ii) The right Riemann sum and iii) The middle Riemann sum are calculated using formulae of specific methods. The methods used are left rule, right rule and Midpoint rule. The resultant graph shows that the calculated Riemann sums are in approximation with the definite integral. Hence, the theoretical calculations are verified in computational results.

**Keywords** – Riemann sums, Definite integral, Left Riemann sum, Right Riemann sum, middle Riemann sum.