# bound on error of Simpson's rule

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If $f$ is Riemann integrable on $[a, b]$ and $|f^{(4)}(x)| \leq M$ for all $x \in [a, b]$, then

$$\left| \int_a^b f(x)\, dx - \left(\frac{b-a}{3n}\right)\left( f(a) + f(b) + 4\sum_{j=1}^{\frac{n}{2}} f\left(a + \frac{(b-a)(2j-1)}{n}\right) + 6\sum_{j=1}^{\frac{n-2}{2}} f\left(a + \frac{(b-a)(2j)}{n}\right) \right) \right| \leq \frac{M(}{1}$$