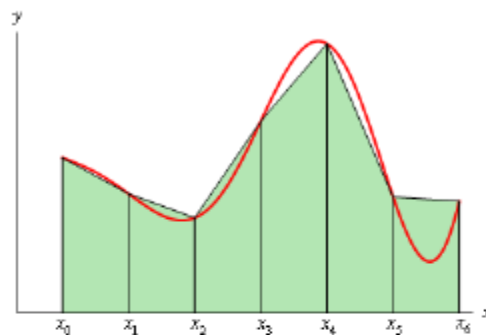


Area of Trapezoid

$$A = 1/2h(b_1 + b_2)$$

Numerical Methods

Trapezoidal Rule



$$P_1(x) = \int_a^b f(x) dx \approx$$

$$\frac{\Delta x}{2} [f(x_0) + 2f(x_1) + 2f(x_3) + \cdots + 2f(x_{n-1}) + f(x_n)]$$

$$\text{where } \Delta x = \frac{b-a}{n}$$

$$\text{and } x_i = a + i\Delta x$$

$$\text{Error Bounds: } |E_T| \leq \frac{K(b-a)^3}{12n^2}$$

Trapezoidal Rule

If a function f is continuous on the closed interval $[a, b]$ where $[a, b]$ has been equally partitioned into n subintervals $[x_0, x_1], [x_1, x_2], \dots, [x_{n-1}, x_n]$, each length $\frac{b-a}{n}$, then

$$\int_a^b f(x) dx \approx \frac{b-a}{2n} [f(x_0) + 2f(x_1) + 2f(x_2) + \dots + 2f(x_{n-1}) + f(x_n)], \text{ which is}$$

equivalent to $\frac{1}{2}(\text{Leftsum} + \text{Rightsum})$