

**Formula sheet:**

**Trapezoidal Rule and Simpson's Rule.**

$$T_n = \frac{\Delta x}{2} \left( y_0 + 2y_1 + 2y_2 + \dots + 2y_{n-1} + y_n \right)$$
$$S_n = \frac{\Delta x}{3} \left( y_0 + 4y_1 + 2y_2 + 4y_3 + \dots + 2y_{n-2} + 4y_{n-1} + y_n \right)$$

**Error estimates for Trapezoidal Rule and Simpson's Rule.**

$$|E_T| \leq \frac{M(b-a)^3}{12n^2}, \quad \text{where } |f''(x)| \leq M \text{ for all } x \text{ in } [a, b]$$
$$|E_S| \leq \frac{M(b-a)^5}{180n^4}, \quad \text{where } |f^{(4)}(x)| \leq M \text{ for all } x \text{ in } [a, b]$$