Formulas.

$$e^x = 1 + x + \frac{x^2}{2!} + \frac{x^3}{3!} + \cdots + \frac{x^n}{n!} + O(x^{n+1}) \qquad \text{as } x \to 0$$

$$\cos(x) = 1 - \frac{x^2}{2!} + \frac{x^4}{4!} - \frac{x^6}{6!} + \cdots + (-1)^n \frac{x^{2n}}{(2n)!} + O(x^{2n+2}) \qquad \text{as } x \to 0$$

$$\sin(x) = x - \frac{x^3}{3!} + \frac{x^5}{5!} - \frac{x^7}{7!} + \cdots + (-1)^n \frac{x^{2n+1}}{(2n+1)!} + O(x^{2n+3}) \qquad \text{as } x \to 0$$

$$\ln(1 + x) = x - \frac{x^2}{2} + \frac{x^3}{3} - \frac{x^4}{4} + \cdots + (-1)^{n+1} \frac{x^n}{n} + O(x^{n+1}) \qquad \text{as } x \to 0$$

$$\sin(\pi) = 0 = 1 + \cos(\pi)$$

$$\frac{d}{dx}\sqrt{x} = \frac{1}{2\sqrt{x}}$$