Разложение некоторых функций в ряд Маклорена

$$e^x = 1 + \frac{x}{1!} + \frac{x^2}{2!} + \ldots + \frac{x^n}{n!} + \ldots = \sum_{n=0}^{\infty} \frac{x^n}{n!}, \ x \in (-\infty; +\infty).$$

$$\sin x = x - \frac{x^3}{3!} + \frac{x^5}{5!} - \ldots + (-1)^n \frac{x^{2n+1}}{(2n+1)!} + \ldots = \sum_{n=0}^{\infty} \frac{(-1)^n x^{2n+1}}{(2n+1)!}, \ x \in (-\infty; +\infty).$$

$$\cos x = 1 - \frac{x^2}{2!} + \frac{x^4}{4!} - \ldots + (-1)^n \frac{x^{2n}}{(2n)!} + \ldots = \sum_{n=0}^{\infty} \frac{(-1)^n x^{2n}}{(2n)!}, \ x \in (-\infty; +\infty).$$

$$\ln(1+x) = x - \frac{x^2}{2} + \frac{x^3}{3} - \ldots + (-1)^{n+1} \frac{x^n}{n} + \ldots = \sum_{n=1}^{\infty} \frac{(-1)^{n+1} x^n}{n}, \ x \in (-1; 1].$$

$$\operatorname{arctg} x = x - \frac{x^3}{3} + \frac{x^5}{5} - \ldots + \frac{(-1)^n x^{2n+1}}{2n+1} + \ldots = \sum_{n=0}^{\infty} \frac{(-1)^n x^{2n+1}}{2n+1}, \ x \in [-1; 1].$$

$$(1+x)^\alpha = 1 + \frac{\alpha}{1!} x + \frac{\alpha \cdot (\alpha-1)}{2!} x^2 + \ldots + \frac{\alpha \cdot (\alpha-1) \cdot \ldots \cdot (\alpha-n+1)}{n!} x^n + \ldots, \ x \in (-1; 1).$$

$$\frac{1}{1-x} = 1 + x + x^2 + \ldots + x^n + \ldots = \sum_{n=0}^{\infty} x^n, \ x \in (-1; 1).$$

$$\frac{1}{1+x} = 1 - x + x^2 - \ldots + (-1)^n x^n + \ldots = \sum_{n=0}^{\infty} (-1)^n x^n, \ x \in (-1; 1).$$