

AP Calculus AB/BC

Some Common Maclaurin Series

$$f(x) = e^x$$

$$\sum_{n=0}^{\infty} \frac{x^n}{n!} = 1 + x + \frac{x^2}{2!} + \frac{x^3}{3!} + \dots \quad -\infty < x < \infty$$

$$f(x) = \sin x$$

$$\sum_{n=0}^{\infty} (-1)^n \frac{x^{2n+1}}{(2n+1)!} = x - \frac{x^3}{3!} + \frac{x^5}{5!} - \frac{x^7}{7!} + \dots - \dots + \dots \quad -\infty < x < \infty$$

$$f(x) = \cos x$$

$$\sum_{n=0}^{\infty} (-1)^n \frac{x^{2n}}{(2n)!} = 1 - \frac{x^2}{2!} + \frac{x^4}{4!} - \frac{x^6}{6!} + \dots - \dots + \dots \quad -\infty < x < \infty$$

$$f(x) = \frac{1}{1-x}$$

$$\sum_{n=0}^{\infty} x^n = 1 + x + x^2 + x^3 + \dots \quad -1 < x < 1$$

$$f(x) = \tan^{-1} x$$

$$\sum_{n=0}^{\infty} (-1)^n \frac{x^{2n+1}}{2n+1} = x - \frac{x^3}{3} + \frac{x^5}{5} - \frac{x^7}{7} + \dots - \dots + \dots \quad -1 \leq x \leq 1$$

$$f(x) = \ln(1+x)$$

$$\sum_{n=0}^{\infty} (-1)^n \frac{x^{n+1}}{n+1} = x - \frac{1}{2}x^2 + \frac{1}{3}x^3 - \frac{1}{4}x^4 + \dots - \dots \quad -1 < x \leq 1$$