삼각함수의 미분법

$$(\sin x)' = \cos x \qquad (\cos x)' = -\sin x \qquad (\tan x)' = -\sec^2 x$$

$$(\csc x)' = -\csc x \cot x \qquad (\sec x)' = \sec x \tan x \qquad (\cot x)' = -\csc^2 x$$

$$(\sin^{-1} x)' = \frac{1}{\sqrt{1-x^2}} \qquad (\cos^{-1} x)' = -\frac{1}{\sqrt{1-x^2}} \qquad (\tan^{-1} x)' = \frac{1}{1+x^2}$$

$$(\csc^{-1} x)' = -\frac{1}{x\sqrt{x^2-1}} \qquad (\sec^{-1} x)' = \frac{1}{x\sqrt{x^2-1}} \qquad (\cot^{-1} x)' = -\frac{1}{1+x^2}$$

라이프니츠 정리

$$\begin{aligned}(fg)^{(n)} &= f^{(n)}g + \binom{n}{1} f^{(n-1)}g^{(1)} + \binom{n}{2} f^{(n-2)}g^{(2)} + \cdots + \binom{n}{r} f^{(n-r)}g^{(r)} + \cdots + fg^{(n)} \\ &= \sum_{k=0}^{n} \binom{\mathrm{n}}{\mathrm{k}} f^{(n-k)}g^{(k)}\end{aligned}$$

로피탈 정리

$$\lim_{\mathrm{x}\to\mathrm{a}} f(x) = 0 = \lim_{x\to a} g(x), \lim_{x\to a} \frac{f(x)}{g(x)} = \lim_{x\to a} \frac{f'(x)}{g'(x)}$$

테일러 급수

$$f(x) = \sum_{n=0}^{\infty} \frac{f^{(n)}(a)}{n!}(x-a)^n$$

부분적분

$$\int_a^b f(x)g'(x)dx = [f(x)g(x)]_a^b - \int_a^b f'(x)g(x)dx$$