

3) 微分

$$(x^k)' = kx^{k-1}$$

$$\left(\frac{1}{x+a}\right)' = -\frac{1}{(x+a)^2}$$

$$(e^{ax})' = ae^{ax}$$

$$(a^x)' = a^x \log a$$

$$(\sin x)' = \cos x$$

$$(\cos x)' = -\sin x$$

$$(\tan x)' = \frac{1}{\cos^2 x}$$

$$(\log x)' = \frac{1}{x}$$

$$(x^x)' = x^x(1 + \log x)$$

$$(\sin^{-1} x)' = \frac{1}{\sqrt{1-x^2}} \quad (x \neq \pm 1)$$

$$(\cos^{-1} x)' = -\frac{1}{\sqrt{1-x^2}} \quad (x \neq \pm 1)$$

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

$$(\sqrt{1+x^2})' = \frac{x}{\sqrt{1+x^2}}$$

4) 積分

$$\int uv' dx = uv - \int u'v dx$$

$$\int x^p dx = \frac{x^{p+1}}{p+1}$$

$$\int \frac{1}{x} dx = \log x$$

$$\int e^{ax} dx = \frac{e^{ax}}{a}$$

$$\int a^x dx = \frac{a^x}{\log a}$$

$$\int \sin x dx = -\cos x$$

$$\int \cos x dx = \sin x$$

$$\int \frac{dx}{\sqrt{a^2-x^2}} = \sin^{-1} \frac{x}{a}$$

$$\int \frac{dx}{x^2+x^2} = \frac{1}{a} \tan^{-1} \frac{x}{a}$$

$$\int \frac{dx}{\sqrt{x^2-a^2}} = \log(x + \sqrt{x^2-a^2})$$

$$\int \frac{dx}{\sqrt{x^2+a^2}} = \log(x + \sqrt{x^2+a^2})$$

$$\int e^{ax} \sin bxdx = \frac{1}{a^2+b^2} e^{ax} (a \sin bx - b \cos bx)$$

$$\int e^{ax} \cos bxdx = \frac{1}{a^2+b^2} e^{ax} (a \cos bx + b \sin bx)$$

$$\int_0^\infty \frac{adx}{x^2+a^2} = \frac{\pi}{2}$$

$$\int_0^\infty e^{-ax} dx = \frac{1}{a}$$

$$\int_0^\infty e^{-ax^2} dx = \frac{1}{2} \sqrt{\frac{\pi}{a}}$$

$$\int_0^\infty x^2 e^{-ax^2} dx = \frac{1}{4} \sqrt{\frac{\pi}{a^3}}$$

$$\int_0^\infty e^{-ax^2} \cos bxdx = \frac{1}{2} \sqrt{\frac{\pi}{a}} e^{-\frac{b^2}{4a}}$$

$$\int_0^\infty e^{-x^2} x \sin bxdx = \frac{\sqrt{\pi}}{4} b e^{-\frac{b^2}{4a}}$$

$$\int_{\frac{\pi}{2}}^{\pi} \sin^{2n} x dx = \int_{\frac{\pi}{2}}^{\pi} \cos^{2n} x dx = \frac{1 \cdot 3 \cdots (2n-1)}{2 \cdot 4 \cdots 2n} \frac{\pi}{2}$$