FORMULAS

$$\frac{d}{dx}\sin x = \cos x, \quad \frac{d}{dx}\cos x = -\sin x, \quad \frac{d}{dx}\tan x = \sec^2 x$$

$$\frac{d}{dx}\cot x = -\csc^2 x, \quad \frac{d}{dx}\sec x = \sec x \tan x, \quad \frac{d}{dx}\csc x = -\csc x \cot x$$

$$\frac{d}{dx}\sin^{-1} x = \frac{1}{\sqrt{1-x^2}}, \quad \frac{d}{dx}\cos^{-1} x = \frac{-1}{\sqrt{1-x^2}}$$

$$\frac{d}{dx}\tan^{-1} x = \frac{1}{1+x^2}, \quad \frac{d}{dx}\sec^{-1} x = \frac{1}{|x|\sqrt{x^2-1}}$$

$$\frac{d}{dx}\ln x = \frac{1}{x}, \quad \frac{d}{dx}\log_a x = \frac{1}{x \ln a}$$

$$\frac{d}{dx}e^x = e^x, \quad \frac{d}{dx}a^x = \ln a a^x, \quad \frac{d}{dx}x^a = ax^{a-1}, \quad \frac{d}{dx}x^x = x^x(1+\ln x)$$

$$\frac{d}{dx}\sinh x = \cosh x, \quad \frac{d}{dx}\cosh x = \sinh x, \quad \frac{d}{dx}\tanh x = \operatorname{sech}^2 x$$

$$\frac{d}{dx}\coth x = -\operatorname{csch}^2 x, \quad \frac{d}{dx}\operatorname{sech} x = -\operatorname{sech} x \tanh x, \quad \frac{d}{dx}\operatorname{csch} x = -\operatorname{csch} x \coth x$$

$$\frac{d}{dx}\sinh^{-1} x = \frac{1}{\sqrt{1+x^2}}, \quad \frac{d}{dx}\cosh^{-1} x = \frac{1}{\sqrt{x^2-1}}$$

$$\frac{d}{dx}\tanh^{-1} x = \frac{1}{1-x^2}, \quad \frac{d}{dx}\operatorname{sech}^{-1} x = \frac{-1}{x\sqrt{1-x^2}}$$

1. $\int k\,du = ku + C$, 2. $\int u^r\,du = \begin{cases} \dfrac{u^{r+1}}{r+1} + C, & \text{if } r \neq -1 \\ \ln|u| + C, & \text{if } r = -1 \end{cases}$

3. $\int e^u\,du = e^u + C$, 4. $\int a^u\,du = \dfrac{a^u}{\ln a} + C,\ a \neq 1,\ a > 0$

5. $\int \sin u\,du = -\cos u + C$, 6. $\int \cos u\,du = \sin u + C$

7. $\int \sec^2 u\,du = \tan u + C$, 8. $\int \csc^2 u\,du = -\cot u + C$

9. $\int \sec u \tan u\,du = \sec u + C$, 10. $\int \csc u \cot u\,du = -\csc u + C$

11. $\int \tan u\,du = -\ln|\cos u| + C$, 12. $\int \cot u\,du = \ln|\sin u| + C$

13. $\int \dfrac{du}{\sqrt{a^2 - u^2}} = \sin^{-1}\left(\dfrac{u}{a}\right) + C$, 14. $\int \dfrac{du}{a^2 + u^2} = \dfrac{1}{a}\tan^{-1}\left(\dfrac{u}{a}\right) + C$

15. $\int \dfrac{du}{u\sqrt{u^2 - a^2}} = \dfrac{1}{a}\sec^{-1}\left(\dfrac{|u|}{a}\right) + C = \dfrac{1}{a}\cos^{-1}\dfrac{a}{|u|} + C$

16. $\int \sinh u\,du = \cosh u + C$ 17. $\int \cosh u\,du = \sinh u + C$

18. $\sin mx \cos nx = \dfrac{1}{2}[\sin(m+n)x + \sin(m-n)x]$

19. $\sin mx \sin nx = -\dfrac{1}{2}[\cos(m+n)x - \cos(m-n)x]$

20. $\cos mx \cos nx = \dfrac{1}{2}[\cos(m+n)x + \cos(m-n)x]$