

$$\begin{aligned}
 & \bullet \frac{d}{dx} c = 0 \quad \text{where } c \text{ is constant} & \bullet \frac{d}{dx} x^n = nx^{n-1} \\
 & \left\{ \begin{aligned} & \bullet \frac{d}{dx} \sin x = \cos x & \bullet \frac{d}{dx} \tan x = \sec^2 x & \bullet \frac{d}{dx} \csc x = -\csc x \cot x \\ & \bullet \frac{d}{dx} \cos x = -\sin x & \bullet \frac{d}{dx} \cot x = -\csc^2 x & \bullet \frac{d}{dx} \sec x = \sec x \tan x \end{aligned} \right. \\
 & \left\{ \begin{aligned} & \bullet \frac{d}{dx} \sin^{-1} x = \frac{1}{\sqrt{1-x^2}} & \bullet \frac{d}{dx} \tan^{-1} x = \frac{1}{1+x^2} & \bullet \frac{d}{dx} \sec^{-1} x = \frac{1}{x\sqrt{x^2-1}} \\ & \bullet \frac{d}{dx} \cos^{-1} x = \frac{-1}{\sqrt{1-x^2}} & \bullet \frac{d}{dx} \cot^{-1} x = \frac{-1}{1+x^2} & \bullet \frac{d}{dx} \csc^{-1} x = \frac{-1}{x\sqrt{x^2-1}} \end{aligned} \right. \\
 & \left\{ \begin{aligned} & \bullet \frac{d}{dx} a^x = a^x \ln a & \bullet \frac{d}{dx} \log_a x = \frac{1}{x \ln a} \\ & \bullet \frac{d}{dx} e^x = e^x & \bullet \frac{d}{dx} \ln x = \frac{1}{x} \end{aligned} \right. \\
 & \left\{ \begin{aligned} & \bullet \frac{d}{dx} \sinh x = \cosh x & \bullet \frac{d}{dx} \tanh x = \operatorname{sech}^2 x & \bullet \frac{d}{dx} \operatorname{sech} x = -\operatorname{sech} x \tanh x \\ & \bullet \frac{d}{dx} \cosh x = \sinh x & \bullet \frac{d}{dx} \coth x = -\operatorname{csch}^2 x & \bullet \frac{d}{dx} \operatorname{csch} x = -\operatorname{csch} x \coth x \end{aligned} \right. \\
 & \left\{ \begin{aligned} & \bullet \frac{d}{dx} \sinh^{-1} x = \frac{1}{\sqrt{1+x^2}} & \bullet \frac{d}{dx} \tanh^{-1} x = \frac{1}{1-x^2} & \bullet \frac{d}{dx} \operatorname{sech}^{-1} x = \frac{-1}{x\sqrt{1-x^2}} \\ & \bullet \frac{d}{dx} \cosh^{-1} x = \frac{1}{\sqrt{x^2-1}} & \bullet \frac{d}{dx} \coth^{-1} x = \frac{1}{1-x^2} & \bullet \frac{d}{dx} \operatorname{csch}^{-1} x = \frac{-1}{x\sqrt{1+x^2}} \end{aligned} \right.
 \end{aligned}$$

Some Important Integrals

$$\begin{aligned}
 & \circ \int x^n dx = \frac{x^{n+1}}{n+1} & \circ \int (ax+b)^n dx = \frac{(ax+b)^{n+1}}{a(n+1)} \\
 & \circ \int \frac{1}{x} dx = \ln|x| & \circ \int \frac{1}{ax+b} dx = \frac{\ln|ax+b|}{a} \\
 & \circ \int e^x dx = e^x & \circ \int e^{(ax+b)} dx = \frac{e^{(ax+b)}}{a} & \circ \int a^x dx = \frac{a^x}{\ln a} \\
 & \circ \int \sin x dx = -\cos x & \circ \int \cos x dx = \sin x \\
 & \circ \int \sec^2 x dx = \tan x & \circ \int \csc^2 x dx = -\cot x \\
 & \circ \int \sec x \tan x dx = \sec x & \circ \int \csc x \cot x dx = -\csc x \\
 & \circ \int \tan x dx = \ln|\sec x| & \circ \int \cot x dx = \ln|\sin x| \\
 & \circ \int \sec x dx = \ln|\sec x + \tan x| & \circ \int \csc x dx = \ln|\csc x - \cot x| \\
 & \circ \int \frac{dx}{\sqrt{a^2-x^2}} = \sin^{-1} \frac{x}{a} \quad \text{or} \quad -\cos^{-1} \frac{x}{a} & \circ \int \frac{dx}{a^2+x^2} = \frac{1}{a} \tan^{-1} \frac{x}{a} \quad \text{or} \quad -\frac{1}{a} \cot^{-1} \frac{x}{a} \\
 & \circ \int \frac{dx}{x\sqrt{x^2-a^2}} = \frac{1}{a} \sec^{-1} \frac{x}{a} \quad \text{or} \quad -\frac{1}{a} \csc^{-1} \frac{x}{a} \\
 & \circ \int \frac{dx}{a^2-x^2} = \frac{1}{2a} \ln \left| \frac{a+x}{a-x} \right| & \circ \int \frac{dx}{x^2-a^2} = \frac{1}{2a} \ln \left| \frac{x-a}{x+a} \right| \\
 & \circ \int \frac{1}{\sqrt{x^2+a^2}} dx = \ln \left| x + \sqrt{x^2+a^2} \right| & \circ \int \frac{1}{\sqrt{x^2-a^2}} dx = \ln \left| x + \sqrt{x^2-a^2} \right| \\
 & \circ \int \sqrt{a^2-x^2} dx = \frac{x\sqrt{a^2-x^2}}{2} + \frac{a^2}{2} \sin^{-1} \left(\frac{x}{a} \right)
 \end{aligned}$$