

Derivatives

$$(i) \frac{d}{dx} \left(\frac{x^{n+1}}{n+1} \right) = x^n ;$$

Particularly, we note that

$$\frac{d}{dx}(x) = 1 ;$$

$$(ii) \frac{d}{dx}(\sin x) = \cos x ;$$

$$(iii) \frac{d}{dx}(-\cos x) = \sin x ;$$

$$(iv) \frac{d}{dx}(\tan x) = \sec^2 x ;$$

$$(v) \frac{d}{dx}(-\cot x) = \operatorname{cosec}^2 x ;$$

$$(vi) \frac{d}{dx}(\sec x) = \sec x \tan x ;$$

$$(vii) \frac{d}{dx}(-\operatorname{cosec} x) = \operatorname{cosec} x \cot x ;$$

$$(viii) \frac{d}{dx}(\sin^{-1} x) = \frac{1}{\sqrt{1-x^2}} ;$$

$$(ix) \frac{d}{dx}(-\cos^{-1} x) = \frac{1}{\sqrt{1-x^2}} ;$$

$$(x) \frac{d}{dx}(\tan^{-1} x) = \frac{1}{1+x^2} ;$$

$$(xi) \frac{d}{dx}(-\cot^{-1} x) = \frac{1}{1+x^2} ;$$

$$(xii) \frac{d}{dx}(\sec^{-1} x) = \frac{1}{x\sqrt{x^2-1}} ;$$

$$(xiii) \frac{d}{dx}(-\operatorname{cosec}^{-1} x) = \frac{1}{x\sqrt{x^2-1}} ;$$

$$(xiv) \frac{d}{dx}(e^x) = e^x ;$$

$$(xv) \frac{d}{dx}(\log |x|) = \frac{1}{x} ;$$

$$(xvi) \frac{d}{dx} \left(\frac{a^x}{\log a} \right) = a^x ;$$

Integrals (Anti derivatives)

$$\int x^n dx = \frac{x^{n+1}}{n+1} + C, n \neq -1$$

$$\int dx = x + C$$

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

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

$$\int \sec^2 x dx = \tan x + C$$

$$\int \operatorname{cosec}^2 x dx = -\cot x + C$$

$$\int \sec x \tan x dx = \sec x + C$$

$$\int \operatorname{cosec} x \cot x dx = -\operatorname{cosec} x + C$$

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

$$\int \frac{dx}{\sqrt{1-x^2}} = -\cos^{-1} x + C$$

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

$$\int \frac{dx}{1+x^2} = -\cot^{-1} x + C$$

$$\int \frac{dx}{x\sqrt{x^2-1}} = \sec^{-1} x + C$$

$$\int \frac{dx}{x\sqrt{x^2-1}} = -\operatorname{cosec}^{-1} x + C$$

$$\int e^x dx = e^x + C$$

$$\int \frac{1}{x} dx = \log |x| + C$$

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