BRIGHT CAREER SCIENCE ACADEMY

DERIVATIVES FORMULAS & RULES

$\frac{d}{dx}x^n = nx^{n-1}$ Where $n \in R$	Power Rule $\frac{d}{dx}[f]^n = n[f]^{n-1}.\frac{d}{dx}f$	Product Rule $\frac{d}{dx}[f.g] = \left[\frac{d}{dx}f\right].g + f.\left[\frac{d}{dx}g\right]$	$\frac{dx}{dx} = 1$ OR $\frac{d}{dx}(x) = 1$
Quotient Rule $\frac{d}{dx}\left[\frac{f}{g}\right] = \frac{g.\left[\frac{d}{dx}f\right] - f.\left[\frac{d}{dx}g\right]}{[g]^2}$	$\frac{d}{dx}\sqrt{f} = \frac{1}{2\sqrt{f}}.\left[\frac{d}{dx}f\right]$	$\frac{dc}{dx} = 0$ OR $\frac{d}{dx}(c) = 0$ Where "c" is constant	$\frac{d}{dx}\mathrm{c}.f(\mathrm{x}) = \mathrm{c}\frac{d}{dx}f(\mathrm{x})$ Where is "c" constant
$\frac{d}{dx}\sin u = \cos u.\frac{du}{dx}$	$\frac{d}{dx}\sinh u = \cosh u.\frac{du}{dx}$	$\frac{d}{dx}\sin^{-1}u = \frac{1}{\sqrt{1-u^2}}.\frac{du}{dx}$	$\frac{d}{dx}\sinh^{-1}u = \frac{1}{\sqrt{1+u^2}}.\frac{du}{dx}$
$\frac{d}{dx}\cos u = -\sin u.\frac{du}{dx}$	$\frac{d}{dx}\cosh u = \sinh u.\frac{du}{dx}$	$\frac{d}{dx}\cos^{-1}u = \frac{-1}{\sqrt{1-u^2}}.\frac{du}{dx}$	$\frac{d}{dx}\cosh^{-1}u = \frac{1}{\sqrt{u^2-1}}.\frac{du}{dx}$
$\frac{d}{dx}\tan u = \sec^2 u.\frac{du}{dx}$	$\frac{d}{dx}\tanh u = \mathrm{sech}^2 u.\frac{du}{dx}$	$\frac{d}{dx}\tan^{-1}u = \frac{1}{1+u^2}.\frac{du}{dx}$	$\frac{d}{dx}\tanh^{-1}u = \frac{1}{1-u^2}.\frac{du}{dx}$
$\frac{d}{dx}\mathrm{cosec}\,u = -\mathrm{cosec}\,u.\cot u.\frac{du}{dx}$	$\frac{d}{dx}\mathrm{cosech}\,u = -\mathrm{cosech}\,u.\coth u.\frac{du}{dx}$	$\frac{d}{dx}\mathrm{cosec}^{-1}u = \frac{-1}{\lvert u\rvert\sqrt{u^2-1}}.\frac{du}{dx}$	$\frac{d}{dx}\mathrm{cosech}^{-1}u = \frac{-1}{u\sqrt{1+u^2}}.\frac{du}{dx}$
$\frac{d}{dx}\sec u = \sec u.\tan u.\frac{du}{dx}$	$\frac{d}{dx}\mathrm{sech}\,u = -\mathrm{sech}\,u.\tanh u.\frac{du}{dx}$	$\frac{d}{dx}\sec^{-1}u = \frac{1}{\lvert u\rvert\sqrt{u^2-1}}.\frac{du}{dx}$	$\frac{d}{dx}\mathrm{sech}^{-1}u = \frac{-1}{u\sqrt{1-u^2}}.\frac{du}{dx}$
$\frac{d}{dx}\cot u = -\mathrm{cosec}^2 u.\frac{du}{dx}$	$\frac{d}{dx}\coth u = -\mathrm{cosech}^2 u.\frac{du}{dx}$	$\frac{d}{dx}\cot^{-1}u = \frac{-1}{1+u^2}.\frac{du}{dx}$	$\frac{d}{dx}\coth^{-1}u = \frac{1}{1-u^2}.\frac{du}{dx}$
$\frac{d}{dx}e^u = e^u.\frac{du}{dx}$	$\frac{d}{dx}a^u = a^u.\ln a.\frac{du}{dx}$	$\frac{d}{dx}\ln u = \frac{1}{u}.\frac{du}{dx}$	$\frac{d}{dx}\log_a u = \frac{1}{u\ln a}.\frac{du}{dx}$

INTEGRATION FORMULAS & RULES

$\int x^n dx = \frac{x^{n+1}}{n+1}$ Where $\mathrm{n} \neq -1$	$\int \frac{f'}{f}dx = \ln\lvert f\rvert$	$\int f^n.f'\,dx = \frac{f^{n+1}}{n+1}$ Where $\mathrm{n} \neq -1$	$\int 1\,dx = x$
$\int \sin ax\,dx = \frac{-\cos ax}{\frac{d}{dx}(ax)}$	$\int e^{ax}dx = \frac{e^{ax}}{\frac{d}{dx}(ax)}$	Integration By Parts Rule $\int f.g\,dx = f.\int g\,dx - \int\left(\frac{d}{dx}f.\int g\,dx\right)dx$	$\int c\,f(\mathrm{x})\,dx = c\int f(\mathrm{x})\,dx$
$\int \cos ax\,dx = \frac{\sin ax}{\frac{d}{dx}(ax)}$	$\int a^{f(\mathrm{x})}dx = \frac{a^{f(x)}}{\ln a.\frac{d}{dx}\mathrm{f}(x)}$	$\int \mathrm{cosec}\,ax.\cot ax\,dx = \frac{-\mathrm{cosec}\,ax}{\frac{d}{dx}(ax)}$	$\int \frac{1}{a^2+x^2}dx = \frac{1}{a}\tan^{-1}\frac{x}{a}$
$\int \tan ax\,dx = \frac{\ln\lvert\sec ax\rvert}{\frac{d}{dx}(ax)}$ OR $\frac{-\ln\lvert\cos ax\rvert}{\frac{d}{dx}(ax)}$	$\int \mathrm{cosec}^2 ax\,dx = \frac{-\cot ax}{\frac{d}{dx}(ax)}$	$\int \sec ax.\tan ax\,dx = \frac{\sec ax}{\frac{d}{dx}(ax)}$	$\int \frac{1}{\sqrt{a^2-x^2}}dx = \sin^{-1}\frac{x}{a}$
$\int \mathrm{cosec}\,ax\,dx = \frac{\ln\lvert\mathrm{cosec}\,ax - \cot ax\rvert}{\frac{d}{dx}(ax)}$	$\int \sec^2 ax\,dx = \frac{\tan ax}{\frac{d}{dx}(ax)}$	Fundamental theorem of calculus $\int_a^b f(x)\,dx = F(b) - F(a)$	$\int \frac{dx}{\sqrt{x^2-a^2}} = \ln\left(x+\sqrt{x^2-a^2}\right)$
$\int \sec ax\,dx = \frac{\ln\lvert\sec ax + \tan ax\rvert}{\frac{d}{dx}(ax)}$	$\int\sqrt{a^2-x^2} = \frac{a^2}{2}\sin^{-1}\frac{x}{a} + \frac{x}{2}\sqrt{a^2-x^2}$	Property of Definite Integral $\int_a^b f(x)\,dx = -\int_b^a f(x)\,dx$	$\int \frac{dx}{a^2-x^2} = \frac{1}{2a}\ln\left\lvert\frac{a+x}{a-x}\right\rvert$
$\int \cot ax\,dx = \frac{\ln\lvert\sin ax\rvert}{\frac{d}{dx}(ax)}$	$\int e^{ax}[a.f(\mathrm{x}) + f'(\mathrm{x})]dx = e^{ax}.f(\mathrm{x})$	Property of Definite Integral $\int_a^b f(\mathrm{x})\,dx = \int_a^c f(\mathrm{x})\,dx + \int_c^b f(\mathrm{x})\,dx$ Where $a < c < b$	$\int \frac{dx}{x^2-a^2} = \frac{1}{2a}\ln\left\lvert\frac{x-a}{x+a}\right\rvert$

Note: Add Integration Constant "c" with Every Indefinite Integration Formula

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