Basic Differentiation Rules

$\frac{d}{dx}[cu] =$		cu'
$\frac{d}{dx}[u \pm v] =$		$u' \pm v'$
$\frac{d}{dx}[uv] =$		$u'v + uv'$
$\frac{d}{dx}\left[\frac{u}{v}\right] =$		$\frac{u'v - uv'}{v^2}$
$\frac{d}{dx}[c] =$		0
$\frac{d}{dx}[u^n] =$		$nu^{n-1}u'$
$\frac{d}{dx}[x] =$		1
$\frac{d}{dx}[\lvert u\rvert] =$		$\frac{u}{\lvert u\rvert}(u'),\ u \neq 0$
$\frac{d}{dx}[\ln u] =$		$\frac{u'}{u}$
$\frac{d}{dx}[e^u] =$		$e^u u'$
$\frac{d}{dx}[log_a u] =$		$\frac{u'}{(\ln a)u}$
$\frac{d}{dx}[a^u] =$		$(\ln a)a^u u'$
$\frac{d}{dx}[\sin u] =$		$(\cos u)u'$
$\frac{d}{dx}[\cos u] =$		$-(\sin u)u'$
$\frac{d}{dx}[\tan u] =$		$(\sec^2 u)u'$
$\frac{d}{dx}[\cot u] =$		$-(\csc^2 u)u'$
$\frac{d}{dx}[\sec u] =$		$(\sec u \tan u)u'$
$\frac{d}{dx}[\csc u] =$		$-(\csc u \cot u)u'$
$\frac{d}{dx}[\arcsin u] =$		$\frac{u'}{\sqrt{1-u^2}}$
$\frac{d}{dx}[\arccos u] =$		$\frac{-u'}{\sqrt{1-u^2}}$
$\frac{d}{dx}[\arctan u] =$		$\frac{u'}{1+u^2}$
$\frac{d}{dx}[\operatorname{arccot} u] =$		$\frac{-u'}{1+u^2}$
$\frac{d}{dx}[\operatorname{arcsec} u] =$		$\frac{u'}{\lvert u\rvert\sqrt{u^2-1}}$
$\frac{d}{dx}[\operatorname{arccsc} u] =$		$\frac{-u'}{\lvert u\rvert\sqrt{u^2-1}}$

Basic Integration Rules (a > 0)

$\int kf(u)\,du$		$k\int f(u)du$
$\int [f(u) \pm g(u)]\,du$		$\int f(u)\,du \pm \int g(u)\,du$
$\int du$		$u + C$
$\int u^n\,du$		$\frac{u^{n+1}}{n+1} + C,\ \ n \neq -1$
$\int \frac{du}{u}$		$\ln\lvert u\rvert + C$
$\int e^u\,du$		$e^u + C$
$\int a^u\,du$		$\left(\frac{1}{\ln a}\right)a^u + C$
$\int \sin u\,du$		$-\cos u + C$
$\int \cos u\,du$		$\sin u + C$
$\int \tan u\,du$		$-\ln\lvert\cos u\rvert + C$
$\int \cot u\,du$		$\ln\lvert\sin u\rvert + C$
$\int \sec u\,du$		$\ln\lvert\sec u + \tan u\,\rvert + C$
$\int \csc u\,du$		$-\ln\lvert\csc u + \cot u\,\rvert + C$
$\int sec^2\,u\,du$		$\tan u + C$
$\int csc^2\,u\,du$		$-\cot u + C$
$\int \sec u \tan u\,du$		$\sec u + C$
$\int \csc u \cot u\,du$		$-\csc u + C$
$\int \frac{du}{\sqrt{a^2 - u^2}}$		$\arcsin\frac{u}{a} + C$
$\int \frac{du}{a^2 + u^2}$		$\frac{1}{a}\arctan\frac{u}{a} + C$
$\int \frac{du}{u\sqrt{u^2 - a^2}}$		$\frac{1}{a}\operatorname{arcsec}\frac{\lvert u\rvert}{a} + C$