Differentiation and Integration Formulas

1.	$\frac{d}{dx}\left(u^n\right)=n\left(u^{n-1}\right)\frac{du}{dx}$	$\int u^n \frac{du}{dx}dx=\frac{1}{n+1}u^{n+1}+\mathrm{C}$
2.	$\frac{d}{dx}\left(\sin u\right)=\cos u\frac{du}{dx}$	$\int \sin u \frac{du}{dx}dx=-\cos u+\mathrm{C}$
3.	$\frac{d}{dx}\left(\cos u\right)=-\sin u\frac{du}{dx}$	$\int \cos u \frac{du}{dx}dx=\sin u+\mathrm{C}$
4.	$\frac{d}{dx}\left(\tan u\right)=\sec^2 u\frac{du}{dx}$	$\int \tan u \frac{du}{dx}dx=-\ln\left\lvert\cos u\right\rvert+\mathrm{C}$
5.	$\frac{d}{dx}\left(\cot u\right)=-\csc^2 u\frac{du}{dx}$	$\int \cot u \frac{du}{dx}dx=\ln\left\lvert\sin u\right\rvert+\mathrm{C}$
6.	$\frac{d}{dx}\left(\sec u\right)=\sec u\tan u\frac{du}{dx}$	$\int \sec u \frac{du}{dx}dx=\ln\left\lvert\sec u+\tan u\right\rvert+\mathrm{C}$
7.	$\frac{d}{dx}\left(\csc u\right)=-\csc u\cot u\frac{du}{dx}$	$\int \csc u \frac{du}{dx}dx=-\ln\left\lvert\csc u+\cot u\right\rvert+\mathrm{C}$
8.	$\frac{d}{dx}\left(\tan u\right)=\sec^2 u\frac{du}{dx}$	$\int \sec^2 u \frac{du}{dx}dx=\tan u+\mathrm{C}$
9.	$\frac{d}{dx}\left(\cot u\right)=-\csc^2 u\frac{du}{dx}$	$\int -\csc^2 u \frac{du}{dx}dx=\cot u+\mathrm{C}$
10.	$\frac{d}{dx}\left(\arcsin u\right)=\frac{1}{\sqrt{1-u^2}}\frac{du}{dx}$	$\int \frac{1}{\sqrt{1-u^2}}\frac{du}{dx}dx=\arcsin u+\mathrm{C}$
11.	$\frac{d}{dx}\left(\arccos u\right)=\frac{-1}{\sqrt{1-u^2}}\frac{du}{dx}$	$\int \frac{-1}{\sqrt{1-u^2}}\frac{du}{dx}dx=\arccos u+\mathrm{C}$
12.	$\frac{d}{dx}\left(\arctan u\right)=\frac{1}{1+u^2}\frac{du}{dx}$	$\int \frac{1}{1+u^2}\frac{du}{dx}dx=\arctan u+\mathrm{C}$
13.	$\frac{d}{dx}\left(\operatorname{arcsec} u\right)=\frac{1}{\left\lvert u\right\rvert\sqrt{u^2-1}}\frac{du}{dx}$	$\int \frac{1}{\left\lvert u\right\rvert\sqrt{u^2-1}}\frac{du}{dx}dx=arc\sec u+C$
14.	$\frac{d}{dx}\left(arc\cot u\right)=\left(\frac{-1}{1+u^2}\right)\frac{du}{dx}$	$\int \left(\frac{-1}{1+u^2}\right)\frac{du}{dx}dx=arc\cot u+C$
15.	$\frac{d}{dx}\left(arc\csc u\right)=\left(\frac{1}{\left\lvert u\right\rvert\sqrt{u^2-1}}\right)\frac{du}{dx}$	$\int \left(\frac{1}{\left\lvert u\right\rvert\sqrt{u^2-1}}\right)\frac{du}{dx}dx=arc\csc u+C$
16.	$\frac{d}{dx}\left(e^u\right)=e^u\frac{du}{dx}$	$\int e^u \frac{du}{dx}dx=e^u+\mathrm{C}$
17.	$\frac{d}{dx}\left(b^u\right)=b^u\ln b\frac{du}{dx}$	$\int b^u \frac{du}{dx}dx=\frac{1}{\ln b}b^u+\mathrm{C}$

18. $\frac{d}{dx}\log_b u = \frac{1}{u \ln b}\frac{du}{dx}$ $\int \frac{1}{u \ln b}\frac{du}{dx}dx = \log_b u + C$

19. $\frac{d}{dx}\ln u = \frac{1}{u}\frac{du}{dx}$ $\int \frac{1}{u}\frac{du}{dx}dx = \ln u + \text{C}$

20. $\frac{d}{dx}\left(\cosh u\right) = \sinh u \frac{du}{dx}$ $\int \cosh u \frac{du}{dx}dx = \sinh u + \text{C}$

21. $\frac{d}{dx}\left(\sinh u\right) = \cosh u \frac{du}{dx}$ $\int \sinh u \frac{du}{dx}dx = \cosh u + \text{C}$