Basic Forms from Calculus I

$$\frac{d}{dx}[k]=0 \qquad \frac{d}{dx}\left[x^n\right]=n\,x^{n-1}$$

$$\frac{d}{dx}[k\,u]=k\,u' \qquad \frac{d}{dx}[u\pm v]=u'\pm v'$$

$$\frac{d}{dx}[u\,v]=u\,v'+v\,u' \qquad \frac{d}{dx}\left[\frac{u}{v}\right]=\frac{v\,u'-u\,v'}{v^2}$$

$$\frac{d}{dx}[f(u)]=f'(u)\cdot u' \qquad \frac{d}{dx}\left[e^u\right]=e^u u' \qquad \frac{d}{dx}[\ln(u)]=\frac{1}{u}u'$$

$$\frac{d}{dx}[\sin(u)]=\cos(u)u' \qquad \frac{d}{dx}[\csc(u)]=-\csc(u)\cot(u)u'$$

$$\frac{d}{dx}[\cos(u)]=-\sin(u)u' \qquad \frac{d}{dx}[\sec(u)]=\sec(u)\tan(u)u'$$

$$\frac{d}{dx}[\tan(u)]=\sec^2(u)u' \qquad \frac{d}{dx}[\cot(u)]=-\csc^2(u)u'$$

$$\frac{d}{dx}\left[\sin^{-1}(u)\right]=\frac{u'}{\sqrt{1-u^2}} \qquad \frac{d}{dx}\left[\tan^{-1}(u)\right]=\frac{u'}{1+u^2} \qquad \frac{d}{dx}\left[\sec^{-1}(u)\right]=\frac{u'}{|u|\sqrt{u^2-1}}$$

$$\int k\ du=k\,u+c \qquad \int u^n\ du=\frac{u^{n+1}}{n+1}+c \quad n\neq -1$$

$$\int k\ f(u)\ du=k\int f(u)\ du \qquad \int[f(u)\pm g(u)]\,du=\int f(u)\,du\pm\int g(u)\,du$$

$$\int e^u\ du=e^u+c \qquad \int\frac{1}{u}\,du=\ln|u|+c \qquad \int u^{-1}\ du=\ln|u|+c$$

$$\int \sin(u)\ du=-\cos(u)+c \qquad \int \csc(u)\cot(u)\ du=-\csc(u)+c$$

$$\int \cos(u)\ du=\sin(u)+c \qquad \int \sec(u)\tan(u)\ du=\sec(u)+c$$

$$\int \tan(u)\ du=\ln|\sec(u)|+c \qquad \int \cot(u)\,du=\ln|\sin(u)|+c$$

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$$\int \sec^2(u)\,du = \tan(u) + c$$

$$\int \csc^2(u)\,du = -\cot(u) + c$$

$$\int \sec(u)\,du = \ln\left|\sec(u) + \tan(u)\right| + c$$

$$\int f(au+b)\,du = \frac{1}{a}F(au+b) + c$$

$$\int \frac{du}{\sqrt{a^2 - u^2}} = \sin^{-1}\left(\frac{u}{a}\right) + c$$

$$\int \frac{1}{a^2 + u^2}du = \frac{1}{a}\tan^{-1}\left(\frac{1}{u}\right) + C$$

$$\int \frac{du}{u\sqrt{u^2 - a^2}} = \frac{1}{a}\sec^{-1}\left(\frac{|u|}{a}\right) + c$$