$$\int F'(x)dx = \int f(x)dx = F(x)+c$$

$$\int f'(x)dx = \int f(x)+c$$

$$\int af(x)dx = a\int f(x)dx$$

$$\int (f(x)\pm g(x))dx = \int f(x)dx \pm \int g(x)dx$$

$$\int x^a dx = \frac{1}{a+1}x^{a+1}+c \quad , \quad a\neq 0$$

$$\int f(g(x))g'(x)dx = \int f(u)du = F(u)+c = F(g(x))+c$$

$$\int (ax+b)^n dx = \frac{1}{a(n+1)}(ax+b)^{n+1}+c$$

$$\int \sin ax\, dx = -\frac{1}{a}\cos ax+c \quad , \quad a\neq 0$$

$$\int \cos ax\, dx = \frac{1}{a}\sin ax+c \quad , \quad a\neq 0$$

$$\int (1+\tan^2 ax)dx = \frac{1}{a}\tan ax+c \quad , \quad a\neq 0$$

$$\int (1+\cot^2 ax)dx = -\frac{1}{a}\cot ax+c \quad , \quad a\neq 0$$

$$\int \tan ax\, dx = -\frac{1}{a}\ln|\cos ax|+c \quad , \quad a\neq 0$$

$$\int \cot ax\, dx = \frac{1}{a}\ln|\sin ax|+c \quad , \quad a\neq 0$$

$$\int \sin ax\cos bx\, dx = \frac{1}{2}\left[\frac{1}{b-a}\cos(a-b)x - \frac{1}{a+b}\cos(a+b)x\right]+c \quad , \quad a\neq b$$

$$\int \sin ax\sin bx\, dx = \frac{1}{2}\left[\frac{1}{b-a}\sin(a-b)x - \frac{1}{a+b}\sin(a+b)x\right]+c \quad , \quad a\neq b$$

$$\int \cos ax\cos bx\, dx = \frac{1}{2}\left[\frac{1}{b-a}\sin(a-b)x + \frac{1}{a+b}\sin(a+b)x\right]+c \quad , \quad a\neq b$$

$$\int e^{ax}dx = \frac{1}{a}e^{ax}+c \quad , \quad a\neq 0$$

$$\int a^x dx = \frac{1}{\ln a}a^x+c \quad , \quad a\neq 1, a>0$$

$$\int \frac{1}{u}dx = \ln|u|+c \quad , u>0$$

$$\int \frac{1}{u\pm a}dx = \ln|u\pm a|+c$$

$$\int \frac{1}{u^2-a^2}du = \frac{1}{2a}\ln\left|\frac{u-a}{u+a}\right|+c$$

$$\int \frac{1}{a^2-u^2}du = \frac{1}{2a}\ln\left|\frac{u+a}{a-u}\right|+c$$

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

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

$$\int \sec x\, dx = \ln|\sec x+\tan x|+c \quad ; \quad (\sec x = \frac{1}{\cos x})$$

$$\int \csc x\, dx = \ln|\csc x-\cot x|+c \quad ; \quad (\csc x = \frac{1}{\sin x})$$

$$\int \sec ax\, dx = \frac{1}{a}\ln|\sec ax+\tan ax|+c \quad ; \quad (\sec x = \frac{1}{\cos x})$$

$$\int \csc ax\, dx = \frac{1}{a}\ln|\csc ax-\cot ax|+c \quad ; \quad (\csc x = \frac{1}{\sin x})$$

$$\int (f(x))^r f'(x)dx = \frac{(f(x))^{r+1}}{r+1}$$

$$\int \frac{f'(x)}{f(x)}dx = \ln|f(x)|$$

$$\int \frac{dx}{x\ln x} = \ln(\ln x)$$

$$\int u\,dv = uv - \int v\,du$$ جزء به جزء

ادامه دارد ...

$$f(x)=c \Rightarrow f'(x)=0 \quad , \quad c=Const$$
$$f(x)=ax+b \Rightarrow f'(x)=a \quad , \quad a,b=Const$$
$$f(x)=ax^n \Rightarrow f'(x)=nax^{n-1} \quad , \quad a=Const$$
$$y=\sqrt[m]{x^n} \Rightarrow y'=\frac{n}{m\sqrt[m]{x^{m-n}}}$$
$$y=\sqrt[m]{f(x)^n} \Rightarrow y'=\frac{nf'(x)}{m\sqrt[m]{f(x)^{m-n}}}$$
$$y=|x| \Rightarrow y'=\frac{x}{|x|}$$
$$y=|f(x)| \Rightarrow y'=\frac{f(x).f'(x)}{|f(x)|}$$
$$y=kf(x) \Rightarrow y'=kf'(x) \quad , \quad k=Const$$
$$y=f(x)\pm g(x) \Rightarrow y'=f'(x)\pm g'(x)$$
$$y=f(x).g(x) \Rightarrow y'=f'(x).g(x)+g'(x).f(x)$$
$$y=\frac{f(x)}{g(x)} \Rightarrow y'=\frac{f'(x).g(x)-g'(x).f(x)}{(g(x))^2}$$

$$y=au^n \Rightarrow y'=nau'u^{n-1}$$
$$y=a^{u(x)} \Rightarrow y'=u'(x)a^{u(x)}\ln a$$
$$y=\log_a^{u(x)} \Rightarrow y'=\frac{u'(x)}{u(x)\ln a}$$
$$y=\ln u(x) \Rightarrow y'=\frac{u'(x)}{u(x)}$$
$$y=e^{u(x)} \Rightarrow y'=u'(x)e^{u(x)}$$
$$y=u(x)^{v(x)} \Rightarrow y'=u(x)^{v(x)}\left[v'(x)\ln u(x)+\frac{u'(x)}{u(x)}.v(x)\right]$$

$$f(x)=\sin x \Rightarrow f'(x)=\cos x$$
$$f(x)=\cos x \Rightarrow f'(x)=-\sin x$$
$$f(x)=\tan x \Rightarrow f'(x)=1+\tan^2 x=\frac{1}{\cos^2 x}=\sec^2 x$$
$$f(x)=\cot g\, x \Rightarrow f'(x)=-(1+\cot g^2 x)=-\frac{1}{\sin^2 x}=-\cos ec^2 x$$
$$f(x)=\sin u(x) \Rightarrow f'(x)=u'(x)\cos u(x)$$
$$f(x)=\cos u(x) \Rightarrow f'(x)=-u'(x)\sin u(x)$$
$$f(x)=\tan u(x) \Rightarrow f'(x)=u'(x)\left(1+\tan^2 u(x)\right)=\frac{u'(x)}{\cos^2 u(x)}$$
$$f(x)=\cot g\, u(x) \Rightarrow f'(x)=-u'(x)\left(1+\cot g^2 u(x)\right)=-\frac{u'(x)}{\sin^2 u(x)}$$

$$y=\sin^n u(x) \Rightarrow y'=nu'(x)\cos u(x).\sin^{n-1} u(x)$$
$$y=\cos^n u(x) \Rightarrow y'=-nu'(x)\sin u(x).\cos^{n-1} u(x)$$
$$y=tg^n u(x) \Rightarrow y'=nu'(x)\left(1+tg^2 u(x)\right).tg^{n-1} u(x)$$
$$y=cotg^n u(x) \Rightarrow y'=-nu'(x)\left(1+cotg^2 u(x)\right).cotg^{n-1} u(x)$$

$$y=\sec u(x) \Rightarrow y'=u'(x)\sec u(x).tgu(x)$$
$$y=\cos ec\, u(x) \Rightarrow y'=-u'(x)\cos ec\, u(x).\cot gu(x)$$

$$y=Arc\sin u(x) \Rightarrow y'=\frac{u'(x)}{\sqrt{1-u^2(x)}}$$
$$y=Arc\cos u(x) \Rightarrow y'=\frac{-u'(x)}{\sqrt{1-u^2(x)}}$$
$$y=Arctgu(x) \Rightarrow y'=\frac{u'(x)}{1+u^2(x)}$$
$$y=Arccotgu(x) \Rightarrow y'=\frac{-u'(x)}{1+u^2(x)}$$
$$y=Arc\sec u(x) \Rightarrow y'=\frac{u'(x)}{u(x)\sqrt{u^2(x)-1}}$$
$$y=Arc\cos ec\, u(x) \Rightarrow y'=\frac{-u'(x)}{u(x)\sqrt{u^2(x)-1}}$$