قوانين التكامل

(1) $\int x^n dx = \dfrac{x^{n+1}}{n+1} + C \,, n \neq -1$

(2) $\int \sin kx \; dx = -\dfrac{\cos kx}{k} + C$

(3) $\int \cos kx \; dx = \dfrac{\sin kx}{k} + C$

(4) $\int \sec^2 x \; dx = \tan x + C$

(5) $\int \csc^2 x \; dx = -\cot x + C$

(6) $\int \sec x \tan x \; dx = \sec x + C$

(7) $\int \csc x \cot x \; dx = -\csc x + C$

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

(9) $\int k f(x) \; dx = k \int f(x) \; dx$

(10) $\int -f(x) \; dx = -\int f(x) \; dx$

(11) $\int \dfrac{d^2 y}{dx^2} \; dx = \dfrac{dy}{dx} + C$, (12) $\int \dfrac{dy}{dx} \; dx = y + C$

(13) $\displaystyle\int \frac{1}{x}dx = \ln|x| + C , x \neq 0$

(14) $\displaystyle\int \frac{f'(x)}{f(x)} dx = \ln|f(x)| + C$

(15) $\displaystyle\int e^x dx = e^x + C$

(16) $\displaystyle\int f'(x)\, e^{f(x)} dx = e^{f(x)} + C$

هام جدا

$\text{Sin}^2 x + \text{Cos}^2 = 1$
$\text{Sin}^2 x = \dfrac{1 - \text{Cos } 2x}{2}$
$\text{Cos}^2 x = \dfrac{1 + \text{Cos } 2x}{2}$
$\tan^2 x = \text{sex}^2 - 1$
$\cot^2 x = \csc^2 - 1$
$\tan x = \dfrac{\sin x}{\cos x}$
$\cot x = \dfrac{\cos x}{\sin x}$

$$\text{Sec } u = \text{sec } u \times \frac{\text{Sec } u + \tan u}{\text{Sec } u + \tan u}$$

$$= \frac{\text{Sec}^2 u + \sec u . \tan u}{\text{Sec } u + \tan u}$$

(21) $\displaystyle\int \sec x\; dx = \ln|\sec x + \tan x| + C$

$$\csc u = \csc u \times \frac{\csc u - \cot u}{\csc u - \cot u}$$

$$= \frac{\csc^2 u - \csc u . \cot u}{\csc u - \cot u}$$

(23) $\displaystyle\int \csc x\; dx = \ln|\csc x - \cot x| + C$