TABLE of INTEGRALS

$$\int x^a dx = \frac{1}{a+1}x^{a+1} + C, \quad a \neq -1 \qquad \int \frac{1}{x}dx = \ln|x| + C = \ln|kx|, \quad C = \ln k$$

$$\int e^{ax}dx = \frac{1}{a}e^{ax} + C \qquad \int a^x dx = \frac{1}{\ln a}a^x + C, \quad a \neq 1$$

$$\int \sin x \; dx = -\cos x + C \qquad \int \cos x \; dx = \sin x + C$$

$$\int \sec^2 x \; dx = \tan x + C \qquad \int \operatorname{cosec}^2 x \; dx = -\cot x + C$$

$$\int \tan x \; dx = \ln|\sec x| + C \qquad \int \cot x \; dx = \ln|\sin x| + C$$

$$\int \sec x \; dx = \ln|\sec x + \tan x| + C \qquad \int \operatorname{cosec} x \; dx = \ln|\operatorname{cosec} x - \cot x| + C$$

$$\int \sinh x \; dx = \cosh x + C \qquad \int \cosh x \; dx = \sinh x + C$$

$$\int \operatorname{sech}^2 x \; dx = \tanh x + C \qquad \int \operatorname{cosech}^2 x \; dx = -\coth x + C$$

$$\int \frac{dx}{1+x^2} = \tan^{-1} x + C, \quad a > 0 \qquad \int \frac{dx}{1-x^2} = \frac{1}{2}\ln\left|\frac{1+x}{1-x}\right| + C, \quad x^2 \neq 1$$

$$\int \frac{dx}{1-x^2} = \tanh^{-1} x + C, \quad |x| < 1 \qquad \int \frac{dx}{1-x^2} = \coth^{-1} x + C, \quad |x| > 1$$

$$\int \frac{dx}{\sqrt{(1-x^2)}} = \sin^{-1} x + C = -\cos^{-1} x + C', \quad |x| \leq 1$$

$$\int \frac{dx}{\sqrt{(x^2+1)}} = \sinh^{-1} x + C = \ln\left(x + \sqrt{(x^2+1)}\right) + C'$$

$$\int \frac{dx}{\sqrt{(x^2-1)}} = \cosh^{-1} x + C, = \ln\left(x + \sqrt{(x^2-1)}\right) + C' \quad x \geq 1$$

$$I_{m,n} = \int \sin^m x \cos^n x \; dx \quad = \frac{\sin^{m+1} x \cos^{n-1} x}{m+n} + \frac{n-1}{m+n} I_{m,(n-2)}$$

$$= -\frac{\sin^{m-1} x \cos^{n+1} x}{m+n} + \frac{m-1}{m+n} I_{(m-2),n}$$