BASIC INTEGRATION RULES AND PROPERTIES

PROPERTIES:

1) $\int k\,f(x)dx = k\int f(x)dx$ where k is a constant

2) $\int [f(x) \pm g(x)]dx = \int f(x)dx \pm \int g(x)dx$

3) $\int_a^b f(x)\,dx = -\int_b^a f(x)\,dx$

RULES:

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

2) $\int \frac{1}{x} dx = \ln|x| + C$

3) $\int e^x dx = e^x + C$

4) $\int a^x dx = \frac{a^x}{\ln a} + C$

5) $\int \sin x\,dx = -\cos x + C$

6) $\int \cos x\,dx = \sin x + C$

7) $\int \tan x\,dx = -\ln|\cos x| + C = \ln|\sec x| + C$

8) $\int \cot x\,dx = \ln|\sin x| + C$

9) $\int \sec x\,dx = \ln|\sec x + \tan x| + C$

10) $\int \csc x\,dx = \ln|\csc x - \cot x| = -\ln|\csc x + \cot x|$

11) $\int \sec^2 x dx = \tan x + C$

12) $\int \csc^2 x dx = -\cot x + C$

13) $\int \sec x \tan x\,dx = \sec x + C$

14) $\int \csc x \cot x\,dx = -\csc x + C$

15) $\int \frac{1}{1+x^2} dx = \arctan x + C$

16) $\int \frac{1}{\sqrt{1-x^2}} dx = \arcsin x + C$

17) $\int \frac{1}{x\sqrt{x^2-1}} dx = \text{arc}\sec|x| + C$