Important Integration formula

- $\int \frac{1}{\sqrt{1-x^2}}\,dx = \sin^{-1} x + C$
- $\int \frac{1}{1+x^2}\,dx = \tan^{-1} x + C$
- $\int \frac{1}{|x|\sqrt{x^2-1}}\,dx = \sec^{-1} x + C$
- $\int \sin^n(x)dx = \frac{-1}{n}\sin^{n-1}(x)\cos(x) + \frac{n-1}{n}\int \sin^{n-2}(x)dx$
- $\int \cos^n(x)dx = \frac{1}{n}\cos^{n-1}(x)\sin(x) + \frac{n-1}{n}\int \cos^{n-2}(x)dx$
- $\int \tan^n(x)dx = \frac{1}{n-1}\tan^{n-1}(x) - \int \tan^{n-2}(x)dx$
- $\int \sec^n(x)dx = \frac{1}{n-1}\sec^{n-2}(x)\tan(x) + \frac{n-2}{n-1}\int \sec^{n-2}(x)dx$
- $\int \csc^n(x)dx = \frac{-1}{n-1}\csc^{n-2}(x)\cot(x) + \frac{n-2}{n-1}\int \csc^{n-2}(x)dx$

Basic integration formula

$\int x^n = x^{n+1} / n+1 + C$

$\int \cos x = \sin x + C$

$\int \sin x = -\cos x + C$

$\int \sec^2 x = \tan x + C$

$\int \text{cosec}^2 x = -\cot x + C$

$\int \sec x \tan x = \sec x + C$

$\int \text{cosec } x \cot x = -\text{cosec } x + C$

$\int dx/\sqrt{} 1- x^2 = \sin^{-1} x + C$

$\int dx/\sqrt{} 1- x^2 = -\cos^{-1} x + C$

$\int dx/\sqrt{} 1+ x^2 = \tan^{-1} x + C$

$\int dx/\sqrt{} 1+ x^2 = -\cot^{-1} x + C$

$\int e^x = e^x + C$

$\int a^x = a^x / \log a + C$

$\int dx/x \sqrt{} x^2 - 1= \sec^{-1} x + C$

$\int dx/x \sqrt{} x^2 - 1= \text{cosec}^{-1} x + C$

$\int 1/x = \log |x| + c$

$\int \tan x = \log |\sec x| + c$

$\int \cot x = \log |\sin x| + c$

$\int \sec x = \log |\sec x + \tan x| + c$

$\int \text{cosec } x = \log |\text{cosec } x - \cot x| + c$

Some Special Function Integrals

$\int dx/(x^2 - a^2) = 1/2a \log |(x - a) / (x + a)| + c$

$\int dx/(a^2 - x^2) = 1/2a \log |(a + x) / (a - x)| + c$

$\int dx / (x^2 + a^2) = 1/a \tan^{(-1)} x / a + c$

$\int dx / \sqrt{(x^2 - a^2)} = \log |"x" + \sqrt{(x^2 -a^2)}| + C$

1.$\int dx / \sqrt{(a^2 - x^2)} = \sin\text{-}1\ x / a + c$

$\int dx / \sqrt{(x^2 + a^2)} = \log |"x" + \sqrt{(x^2 + a^2)}| + C$

Definite Integration Properties

P_0 : $\int a \to b \;\; f(x)\, dx = \int a \to b \;\; f(t)\, dt$

P_1 : $\int a \to b \;\; f(x)\, dx = -\int b \to a \;\; f(x)\, dx$ .In particular, $\int a \to a \;\; f(x)\, dx = 0$

P_2 : $\int a \to b \;\; f(x)\, dx = \int a \to c\ f(x)\, dx + \int c \to b\ f(x)\, dx$

P_3 : $\int a \to b\ f(x)\, dx = \int a \to b \;\; f(a + b - x)\, dx$.

P_4 : $\int 0 \to a\ f(x)dx = \int 0 \to a \;\; f(a - x)\, dx$

P_5 : $\int 0 \to 2a \;\; f(x)\, dx = \int 0 \to a \;\; f(x)\, dx + \int 0 \to a\ f(2a - x)\, dx$

P_6 : $\int 0 \to 2a\ f(x) = \{(2\int 0 \to a \;\; f(x)\, dx,$ if $f(2a - x) = f(x)$, if $f(2a - x) = -f(x))$

P_7 : $\int (-a) \to a\ f(x) = \{(2\int 0 \to a\ f(x)\, dx,$ if $f(-x) = f(x)$, if $f(-x) = -f(x)$