Important Formulae of INTEGRATION (Indefinite Integration)

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

(2) $\int x^{-1} dx = \int \frac{1}{x} dx = \log x + C$

(3) $\int dx = \int x^0 dx = \frac{x^{0+1}}{0+1} = x + C$

(4) $\int (u+v) dx = \int u dx + \int v dx + C$

(5) $\int Au\, dx = A\int u dx + C$ where c = const. and u is function of x

(6) $\int Ax^n dx = A\frac{x^{n+1}}{n+1} + C$

(7) $\int e^{Ax} dx = \frac{e^x}{A} + C$

(8) $\int a^x dx = \frac{a^x}{\log_e(a)} + C$, where, 'a' is a constant.

(9) $\int \sin(Ax) dx = -\frac{\cos Ax}{A} + C$

(10) $\int \cos(Ax) dx = \frac{\sin Ax}{A} + C$

(11) $\int \sec^2(Ax) dx = \frac{\tan Ax}{A} + C$

Where, C is constant of integration. The value of C is determined by using limiting conditions.

- **In case of definite integration, where limits of integration are used, the constant of integration is not taken into consideration.**
- **The lower limit and upper limit are the initial and final values of independent variable respectively.**