Integration :- There are two distinct views point from the process of integration can be considered

We may consider Integration as the inverse of differentiation or we say that start with defining Integration as a certain Summations.

(i) integration as the inverse process of diffeerintion :-

If $F(x)$ be a given function of x and if another function $F(x)$ be obtained such that its differential coefficient w.r to x is equal to $F(x)$ then.

$F(x)$ is defined as integral or more Property of indefinite integral of $F(x)$ w.r to x. The process of Finding integral of a function of x is Called integration. and the operation is obtained by writing integral Sign $\int$ fx function and dx the function.

The differential dx indicates x as variable of the integral the function to be integrated is Called the integral.

Symbolically $\frac{d}{dx} F(x) = f(x)$ then

$$\int F(x) \cdot dx = F(x)$$

Where $\int F(x) \cdot dx$ is Called indefinite integral of $F(x)$ w.r to x.

Definite integral :-

If $f(x)$ be given function and $F(x)$ is an integral of x. and $x-a$ & $x-b$ be two given Values of x. Then Change in the value of integral

function $F(x)$ ... x ...

i.e quantity $F(b) - F(a)$ is defined as the definite integral of $F(x)$ between limits a & b and is denoted by $\int_a^b F(x) \cdot dx$.

In otherwards

$$\frac{d}{dx} F(x) = f(x)$$

$$\Rightarrow \int_a^b \frac{d}{dx} F(x) \cdot dx = \int_a^b F(x) \cdot dx$$

$$\Rightarrow F(b) - F(a) = \int_a^b F(x) \cdot dx$$

which is Called definite integral of $F(x)$ between a to b where b is upper limit & a lower limit.

Constant of integration :-

It may be noted that of $\frac{d}{dx}\{F(x)\} = F(x)$ then also we have $\frac{d}{dx}\{F(x)+C\} = F(x)$ where C is arbitrary Const.

Thus of $\int F(x) \cdot dx = F(x)$. a general value of the indefinite integral

$$\Rightarrow \int F(x) \cdot dx = F(x) + C$$

In otherwards, in finding indefinite integral of a function $F(x)$, an arbitrary Constant to be added to result to make it general.

This is the reason why the integral is x to as an indefinite integral and Constant is Called Constant of integration.