

Definition.

Let $f(x)$ be a function. Then the collection of all its primitives is called the indefinite integral of $f(x)$ and is denoted by $\int f(x) dx$.

$$\text{Thus, } \frac{d}{dx}(\phi(x) + c) = f(x) \Rightarrow \int f(x) dx = \phi(x) + c$$

Where $\phi(x)$ is primitive of $f(x)$ and c is an arbitrary constant known as the constant of integration.

Here \int is the integral sign, $f(x)$ is the integrand, x is the variable of integration and dx is the element of integration.

The process of finding an indefinite integral of a given function is called integration of the function.

It follows from the above discussion that integrating a function $f(x)$ means finding a function

$$\phi(x) \text{ such that } \frac{d}{dx}(\phi(x)) = f(x).$$