$\int_a^b f(x)dx = \lim_{h\to 0} h\sum_{r=0}^{n-1} f(a+rh) = \lim_{h\to 0} h\sum_{r=1}^{n} f(a+rh)$ [where, nh=b-a]

(2)Fundamental theorem of definite integral

If f(x) is integrable in $a \le x \le b$ & f(x) = $\emptyset'(x)$ then

$\int_a^b f(x)dx = \emptyset(b) - \emptyset(a)$

Remember: There is no integration constant in definite integrals.

Formulae on Definite Integrals:-

(1) $\int_a^b f(x)dx = \int_a^b f(z)dz$

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

(3) $\int_a^b f(x)dx = \int_a^c f(x)dx + \int_c^b f(x)dx$, a < c < b

(4) $\int_0^a f(x)dx = \int_0^a f(a-x)dx$

(5) $\int_0^{na} f(x)dx = n\int_0^a f(x)dx$ if f(a+x) = f(x)

(6) $\int_0^{2a} f(x)dx = 2\int_0^a f(x)dx$, $if\ f(2a-x) = f(x)$ = 0, $if\ f(2a-x) = -f(x)$

(7) $\int_{-a}^a f(x)dx = 2\int_0^a f(x)dx$, $if\ f(-x) = f(x)\ i.e.\ f(x)\ is\ an\ even\ function$

= 0, $if\ f(-x) = -f(x)\ i.e.\ f(x)\ is\ an\ odd\ function.$

(8) $\int_a^b f(x)dx = \int_a^b f(a+b-x)$