

Properties of Integrals.

(1) The differentiation of an integral is the integrand itself or the process of differentiation and integration neutralize each other, *i.e.*, $\frac{d}{dx} \left[\int f(x) dx \right] = f(x)$.

(2) The integral of the product of a constant and a function is equal to the product of the constant and the integral of the function, *i.e.*, $\int cf(x) dx = c \int f(x) dx$.

(3) Integral of the sum or difference of two functions is equal to the sum or difference of their integrals, *i.e.*, $\int \{f_1(x) \pm f_2(x)\} dx = \int f_1(x) dx \pm \int f_2(x) dx$

In the general form, $\int \{k_1 \cdot f_1(x) \pm k_2 \cdot f_2(x) \pm k_3 \cdot f_3(x) \pm \dots\} dx$