

Rules of Integration

- (i) $\frac{d}{dx} \left\{ \int f(x) dx \right\} = f(x)$
- (ii) $\int k \cdot f(x) dx = k \int f(x) dx$
- (iii) $\int \{f_1(x) \pm f_2(x) \pm f_3(x) \pm \dots \pm f_n(x)\} dx$
 $= \int f_1(x) dx \pm \int f_2(x) dx \pm \int f_3(x) dx \pm \dots \pm \int f_n(x) dx$
- (iv) $\int f' \{g(x)\} \cdot g'(x) dx = f\{g(x)\} + C$

Method of Substitution

- (i) $\frac{d}{dx} \left\{ \int f(x) dx \right\} = f(x)$
- (ii) $\int k \cdot f(x) dx = k \int f(x) dx$
- (iii) $\int \{f_1(x) \pm f_2(x) \pm f_3(x) \pm \dots \pm f_n(x)\} dx$
 $= \int f_1(x) dx \pm \int f_2(x) dx \pm \int f_3(x) dx \pm \dots \pm \int f_n(x) dx$
- (iv) $\int f' \{g(x)\} \cdot g'(x) dx = f\{g(x)\} + C$

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Here, all the constant cannot be calculated by using the method in Case I. However, $B_1, B_2, B_3, \dots, B_n$ can be found using the same method i.e., shortcut can be applied only in the case of non-repeated linear factor.

Integration of Irrational Algebraic Function

Irrational function of the form of $(ax + b)^{1/n}$ and x can be evaluated by substitution $(ax + b) = t^n$, thus

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