

9.1 Indefinite Integral

865. $\int f(x)dx = F(x) + C$ if $F'(x) = f(x)$.

866. $\left(\int f(x)dx\right)' = f(x)$

867. $\int kf(x)dx = k\int f(x)dx$

868. $\int [f(x) + g(x)]dx = \int f(x)dx + \int g(x)dx$

869. $\int [f(x) - g(x)]dx = \int f(x)dx - \int g(x)dx$

870. $\int f(ax)dx = \frac{1}{a}F(ax) + C$

871. $\int f(ax + b)dx = \frac{1}{a}F(ax + b) + C$

872. $\int f(x)f'(x)dx = \frac{1}{2}f^2(x) + C$

873. $\int \frac{f'(x)}{f(x)}dx = \ln|f(x)| + C$

874. Method of Substitution

$$\int f(x)dx = \int f(u(t))u'(t)dt \text{ if } x = u(t).$$

875. Integration by Parts

$$\int u dv = uv - \int v du,$$

where $u(x)$, $v(x)$ are differentiable functions.