

! For an efficient use of these tables, first read [HowTo.pdf](#).

**T1.01.** Definitions and general formulas.

1.  $\int a \, dx = ax.$
2.  $\int a f \, dx = a \int f \, dx.$
3.  $\int \{\pm a f \pm b g \pm c h \pm \dots\} \, dx = \pm a \int f \, dx \pm \int b g \, dx \pm \int c h \, dx \pm \dots$
4.  $\frac{d}{dx} \int f \, dx = f.$
5.  $\int f' \, dx = f.$
6.  $\int f' g \, dx = f g - \int f g' \, dx$  (integration by parts).
7.  $\int u \, dv = u \int dv - \int v \, du = u v - \int v \, du$  (integration by parts).
8.  $\int u \frac{dv}{dx} \, dx = u v - \int \frac{du}{dx} \, dx$  (integration by parts).
9.  $\int f^{(n+1)} g \, dx = g f^{(n)} - g' f^{(n-1)} + g'' f^{(n-2)} - \dots + (-1)^n g^n f + (-1)^{n+1} \int g^{(n+1)} f \, dx.$
10.  $\int f(x) \, dx = \int f(g(y)) g'(y) \, dy.$
11.  $\int (f)^n f' \, dx = \frac{(f)^{n+1}}{n+1}, \quad n \neq -1.$
12.  $\int \frac{f'(x)}{f(x)} \, dx = \ln f(x).$
13.  $\int (af + b)^n f' \, dx = \frac{(af + b)^{n+1}}{a(n+1)}, \quad n \neq -1.$
14.  $\int \frac{f'(x)}{2\sqrt{f(x)}} \, dx = \sqrt{f(x)}.$

15.  $\int \frac{f'}{2\sqrt{af+b}} dx = \frac{\sqrt{af+b}}{a}.$
  16.  $\int \frac{f'g - fg'}{g^2} dx = \frac{f}{g}.$
  17.  $\int \frac{f'g - fg'}{fg} dx = \ln \frac{f}{g}.$
  18.  $\int \frac{dx}{f(f \pm g)} = \pm \int \frac{dx}{fg} \mp \int \frac{dx}{g(f \pm g)}.$
  19.  $\int \frac{f'}{\sqrt{f^2+a}} dx = \ln(f + \sqrt{f^2+a}).$
  20.  $\int \frac{f}{(f+a)(f+b)} dx = \frac{a}{a-b} \int \frac{dx}{f+a} - \frac{b}{a-b} \int \frac{dx}{f+b}.$
  21.  $\int \frac{f}{(f+a)^2} dx = \int \frac{dx}{f+a} - a \int \frac{dx}{(f+a)^2}.$
  22.  $\int \frac{f}{(f+g)^n} dx = \int \frac{dx}{(f+g)^{n-1}} - \int \frac{dx}{(f+g)^n}.$
  23.  $\int \frac{f'}{a^2 + b^2 f^2} dx = \frac{1}{ab} \tan^{-1} \frac{bf}{a}.$
  24.  $\int \frac{f'}{b^2 f^2 - a^2} dx = \frac{1}{2ab} \ln \frac{bf-a}{bf+a}.$
  25.  $\int \frac{f^2}{f^2 - a^2} dx = \frac{1}{2} \left[ \int \frac{f}{f-a} dx + \int \frac{f}{f+a} dx \right].$
  26.  $\int \frac{f'}{\sqrt{a^2 - f^2}} dx = \sin^{-1} \frac{f}{a}.$
  27.  $\int \frac{f'g - fg'}{f^2 + g^2} dx = \tan^{-1} \frac{f}{g}.$
  28.  $\int \frac{f'g - fg'}{f\sqrt{f^2 - g^2}} dx = \frac{1}{a} \sec^{-1} \frac{f}{g}.$
  29.  $\int \frac{f'g - fg'}{f^2 - g^2} dx = \frac{1}{2} \ln \frac{f-g}{f+g}.$
  30.  $\int \frac{f'}{af^2 + bf} dx = \frac{1}{b} \ln \frac{f}{af+b}.$
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