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Integral Formulas

(1) $\int x^r dx = \frac{1}{r+1}x^{r+1} + C \qquad -1 \neq r$

(2) $\int x^{-1} dx = \int \frac{1}{x} dx = \ln|x| + C$

(3) $\int \frac{1}{ax+b} dx = \frac{1}{a}\ln|ax+b| + C$

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

(5) $\int K dx = Kx + C$

(6) $\int K f(x) dx = K \int f(x) dx$

(7) $\int (f(x)+g(x)) dx = \int f(x) dx + \int g(x) dx$

(8) $\int a^x dx = \frac{1}{\ln a} a^x + C$

(9) $\int e^x dx = e^x + C$

(10) $\int \sin(ax+b) dx = -\frac{1}{a}\cos(ax+b) + C$

(11) $\int \cos(ax+b) dx = \frac{1}{a}\sin(ax+b) + C$

(12) $\int \tan(ax+b) dx = \frac{1}{a}\ln|\sec(ax+b)| + C$

(13) $\int \cot(ax+b) dx = \frac{1}{a}\ln|\sin(ax+b)| + C$

(14) $\int \sec(ax+b) dx = \frac{1}{a}\ln|\sec(ax+b)+\tan(ax+b)| + C$

(15) $\int \csc(ax+b) dx = \frac{1}{a}\ln|\csc(ax+b)-\cot(ax+b)| + C$

(16) $\int \sec^2(ax+b) dx = \frac{1}{a}\tan(ax+b) + C$

(17) $\int \csc^2(ax+b) dx = -\frac{1}{a}\cot(ax+b) + C$

(18) $\int \sec(ax+b).\tan(ax+b) dx = \frac{1}{a}\sec(ax+b) + C$

(19) $\int \csc(ax+b).\cot(ax+b) dx = -\frac{1}{a}\csc(ax+b) + C$

(20) $\int \frac{dx}{\sqrt{a^2-x^2}} = sin^{-1}(\frac{x}{a}) + C$

(21) $\int \frac{dx}{a^2+x^2} = \frac{1}{a}tan^{-1}(\frac{x}{a}) + C$

(22) $\int \frac{dx}{x\sqrt{x^2-a^2}} = \frac{1}{a}sec^{-1}(|\frac{x}{a}|) + C$

(23) Substitution: If $\int f(x) dx = g(x)$, then $\int f(u) du = g(u)$

(24) By Parts: $\int U dV = U.V - \int V du$

(25)

Trigonometric Substitutions:

$a^2 - u^2$	$u = a\sin\theta$
$a^2 + u^2$	$u = a\tan\theta$
$u^2 - a^2$	$u = a\sec\theta$