1. Formulas

Note: constants of integration are omitted

$\int \sec^2 x \, dx$	$=$	$\tan x$
$\int \csc^2 x \, dx$	$=$	$-\cot x$
$\int \sec x \tan x \, dx$	$=$	$\sec x$
$\int \csc x \cot x \, dx$	$=$	$-\csc x$
$\int \sec x \, dx$	$=$	$\ln \lvert \sec x + \tan x \rvert$
$\int \csc x \, dx$	$=$	$\ln \lvert \csc x - \cot x \rvert$
$\int \tan x \, dx$	$=$	$\ln \lvert \sec x \rvert$
$\int \cot x \, dx$	$=$	$\ln \lvert \sin x \rvert$
$\int dx/(x^2 + a^2)$	$=$	$(1/a) \tan^{-1}(x/a)$
$\int_1^\infty 1/x^p$		converges if $p > 1$ diverges otherwise
$\sqrt{a^2 - x^2}$	*use*	$a \sin\theta \quad -\pi/2 \le \theta \le \pi/2$
$\sqrt{a^2 + x^2}$	*use*	$a \tan\theta \quad -\pi/2 \le \theta \le \pi/2$
$\sqrt{x^2 - a^2}$	*use*	$a \sec\theta \quad 0 \le \theta \le \pi/2$
$\sin A \cos B$	$=$	$\frac{1}{2}[\sin(A-B) + \sin(A+B)]$
$\sin A \sin B$	$=$	$\frac{1}{2}[\cos(A-B) - \cos(A+B)]$
$\cos A \cos B$	$=$	$\frac{1}{2}[\cos(A-B) + \cos(A+B)]$
$\cos^2\theta$	$=$	$\frac{1}{2}[1 + \cos 2\theta]$
$\sin^2\theta$	$=$	$\frac{1}{2}[1 - \cos 2\theta]$
$\lvert E_S \rvert \le K(b-a)^5/180n^4$	*where*	$\lvert f^{(4)}(x) \rvert \le K$ for $a \le x \le b$
$\lvert E_T \rvert \le K(b-a)^3/12n^2$	*where*	$\lvert f''(x) \rvert \le K$ for $a \le x \le b$
$\lvert E_M \rvert \le K(b-a)^3/24n^2$	*where*	$\lvert f''(x) \rvert \le K$ for $a \le x \le b$