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Calculus 2 Convergence and Divergence Tests Chart:

Test	Converges	Diverges	Inconclusive
limit	None	$\lim_{n\to\infty} a_n \neq 0$	$\lim_{n\to\infty} a_n = 0$
ratio (the go-to test)	$\lim_{n\to\infty}\left\|\frac{a_{n+1}}{a_n}\right\| < 1$	$\lim_{n\to\infty}\left\|\frac{a_{n+1}}{a_n}\right\| > 1$	$\lim_{n\to\infty}\left\|\frac{a_{n+1}}{a_n}\right\| = 1$
geometric $(form\ of \sum_0^\infty r^n)$	$\|r\| < 1$ $converges\ to\ \frac{1}{1-r}$	$\|r\| > 1$	None
root $(n\ power\ in\ expon.)$	$\lim_{n\to\infty}\sqrt[n]{\|a_n\|} < 1$	$\lim_{n\to\infty}\sqrt[n]{\|a_n\|} > 1$	$\lim_{n\to\infty}\sqrt[n]{\|a_n\|} = 1$
$p - series$ $(form\ of\ \frac{1}{n^p})$	$p > 1$	$p \leq 1$	None
integral $(positive, decreasing, continuous$ $a_n\ for\ n \geq 1)$	$\int_1^\infty a_n dn < \infty$	$\int_1^\infty a_n dn = \infty$	None
$Leibniz's/alternating$ $(form\ of\ \sum_1^\infty (-1)^{n+c} a_n)$	$a_n\ is\ decreasing$ $and\ limits\ to\ zero$	None	None
direct comparison $(for\ a_n\ with\ small\ changes\ from$ $a\ known\ series\ b_n)$	$for \sum b_n > \sum a_n$ $and \sum b_n\ converges$	$for \sum b_n < \sum a_n$ $and \sum b_n\ diverges$	None
limit comparison $(similar\ to\ direct\ comparison$ $test)$	$for\ positive\ a_n\ and\ b_n$ $0 < \lim_{n\to\infty}\frac{a_n}{b_n} < \infty$ $and\ b_n\ converges$	$for\ positive\ a_n\ and\ b_n$ $0 < \lim_{n\to\infty}\frac{a_n}{b_n} < \infty$ $and\ b_n\ diverges$	None