Test	Series	Converges	Diverges	Comment
nth -term	$\sum_{n=1}^{\infty} a_n$		$\lim_{n\to\infty} a_n \neq 0$	Cannot be used to show convergence
Geometric series	$\sum_{n=0}^{\infty} ar^{n-1}$	$\lvert r\rvert < 1$	$\lvert r\rvert \geq 1$	Sum is $S = \frac{a}{1-r}$
Telescoping Series	$\sum_{n=1}^{\infty} \left(a_n - a_{n+1}\right)$	$\lim_{n\to\infty} a_n = L$		Sum is $S = a_1 - L$
p-series	$\sum_{n=1}^{\infty} \frac{1}{n^p}$	$p > 1$	$p \leq 1$	
Alternating Series	$\sum_{n=1}^{\infty} (-1)^{n-1} a_n$	$0 < a_{n+1} \leq a_n$ and $\lim_{n\to\infty} a_n = 0$		Remainder $R_n = S - S_n$: $\lvert R_n\rvert \leq a_{n+1}$
Integral (*f* is continuous, positive, and decreasing)	$\sum_{n=1}^{\infty} a_n$, $a_n = f(n) \geq 0$	$\int_1^{\infty} f(x)dx$ converges	$\int_1^{\infty} f(x)dx$ diverges	Remainder: $0 \leq R_n \leq \int_n^{\infty} f(x)dx$
Root	$\sum_{n=1}^{\infty} a_n$	$\lim_{n\to\infty} \sqrt[n]{a_n} < 1$	$\lim_{n\to\infty} \sqrt[n]{a_n} > 1$	Test is inconclusive if $\lim_{n\to\infty} \sqrt[n]{a_n} = 1$.
Ratio	$\sum_{n=1}^{\infty} a_n$	$\lim_{n\to\infty} \left\lvert \frac{a_{n+1}}{a_n} \right\rvert < 1$	$\lim_{n\to\infty} \left\lvert \frac{a_{n+1}}{a_n} \right\rvert > 1$	Test is inconclusive if $\lim_{n\to\infty} \left\lvert \frac{a_{n+1}}{a_n} \right\rvert = 1$.
Direct Comparison $(a_n, c_n, d_n > 0)$	$\sum_{n=1}^{\infty} a_n$	$0 \leq a_n \leq c_n$ and $\sum_{n=1}^{\infty} c_n$ converges	$0 \leq d_n \leq a_n$ and $\sum_{n=1}^{\infty} d_n$ diverges	
Limit Comparison $(a_n, c_n, d_n > 0)$	$\sum_{n=1}^{\infty} a_n$	$\lim_{n\to\infty} \frac{a_n}{c_n} = L > 0$ and $\sum_{n=1}^{\infty} c_n$ converges	$\lim_{n\to\infty} \frac{a_n}{d_n} = L > 0$ and $\sum_{n=1}^{\infty} d_n$ diverges	