

For each test below applied to $\sum_{n=1}^{\infty} a_n$ [where $a_n = f(n)$], list the work you must do and/or conditions you must check upfront, and under what final condition the test says that a series converges or diverges.

Mark if a test might give no conclusion even if the upfront checks are all true.

Test name	Upfront work / checks	Final condition	Conclusion
p-series	check $a_n = \frac{1}{n^p}$	if $p > 1$	$\sum_{n=1}^{\infty} a_n$ converges
		if $p \leq 1$	$\sum_{n=1}^{\infty} a_n$ diverges
geometric			
root			
divergence possibly no conclusion	find $\lim_{n \rightarrow \infty} a_n$	if limit $\neq 0$	$\sum_{n=1}^{\infty} a_n$ diverges
alternating			
ratio			
absolute convergence			
telescoping			
limit comparison			
comparison			
integral	check f continuous, $f > 0$ and f decreasing on $[1, \infty)$; find if $\int_1^{\infty} f(x) \, dx$ converges	if $\int_1^{\infty} f(x) \, dx$ converges	$\sum_{n=1}^{\infty} a_n$ converges
		if $\int_1^{\infty} f(x) \, dx$ diverges	$\sum_{n=1}^{\infty} a_n$ diverges