Series Test	What it can show	When to try it	Hypotheses	How to Make Conclusions	Examples
Divergence Test	Divergence	If you think a series diverges	(none)	If $\lim_{n\to\infty} a_n \neq 0$ *or* DNE, then $\sum_{n=1}^{\infty} a_n$ diverges	$\sum_{n=1}^{\infty} n$, $\sum_{n=1}^{\infty}(-1)^n$
p-series Test	Convergence or Divergence	If your series looks like: $\sum_{n=1}^{\infty} \frac{1}{n^p}$ for some fixed p. *Exponent is fixed*	Must be of the form $\sum_{n=1}^{\infty} \frac{1}{n^p}$	If $p \leq 1$, $\sum_{n=1}^{\infty} a_n$ diverges. If $p > 1$, $\sum_{n=1}^{\infty} a_n$ converges.	$\sum_{n=1}^{\infty} \frac{3}{n^7}$, NOT: $\sum_{n=1}^{\infty} \frac{3}{(n+1)^7}$
Geometric Series	Convergence or Divergence	If your series looks like: $\sum_{n=1}^{\infty} ar^{n-1}$ for some fixed r. *Base is fixed*	Must be of the form $\sum_{n=1}^{\infty} ar^{n-1}$	If $\lvert r\rvert \geq 1$, $\sum_{n=1}^{\infty} ar^{n-1}$ diverges. If $\lvert r\rvert < 1$, $\sum_{n=1}^{\infty} ar^{n-1}$ converges to $\frac{a}{1-r}$.	$\sum_{n=1}^{\infty} 12(\frac{\pi}{4})^{n-1}$
Integral Test	Convergence or Divergence	The terms define an integrable function	On $[1,\infty)$, $f(x)$ with $f(n) = a_n$ must be **continuous**, **positive**, and **decreasing**.	If $\int_1^{\infty} f(x)dx$ converges, then so does $\sum_{n=1}^{\infty} a_n$. If $\int_1^{\infty} f(x)dx$ diverges, then so does $\sum_{n=1}^{\infty} a_n$.	$\sum_{n=2}^{\infty} \frac{1}{nln(n)}$
(Direct/Term) Comparison Test	Convergence or Divergence	Terms are $\geq$ known div series terms OR terms are $\leq$ known conv. series terms. (smaller than small is small; bigger than big is big)	Terms of your series must be positive; terms of known series must be positive.	If $0 \leq a_n \leq b_n$ and $\sum_{n=1}^{\infty} b_n$ converges, then $\sum_{n=1}^{\infty} a_n$ converges. If $0 \leq b_n \leq a_n$ and $\sum_{n=1}^{\infty} b_n$ diverges, then $\sum_{n=1}^{\infty} a_n$ diverges.	$\sum_{n=1}^{\infty} \frac{n^2+1}{n^3+3}$
Limit Comparison Test	Convergence or Divergence	Terms "look like" known div. or conv. series terms	Terms of your series AND known series must be > 0	If $0 < \lim_{n\to\infty} \frac{a_n}{b_n} < \infty$, then $\sum_{n=1}^{\infty} a_n$ converges/diverges as $\sum_{n=1}^{\infty} b_n$.	$\sum_{n=1}^{\infty} \frac{n^2-1}{n^3-3}$
Alt. Series Test	Convergence	When $(-1)^n$, $(-1)^{n-1}$, or $cos(n\pi)$ appear in the terms	$\lvert a_n\rvert$ must be decreasing	If $\lim_{n\to\infty} \lvert a_n\rvert = 0$, then the series $\sum_{n=1}^{\infty} (-1)^n a_n$ converges.	$\sum_{n=1}^{\infty} \frac{(-1)^n}{n}$
Ratio Test	Absolute Convergence or Divergence	When there are factorials and/or exponentials	(none)	If $\lim_{n\to\infty} \lvert\frac{a_{n+1}}{a_n}\rvert < 1$, the series abs. Conv. If $\lim_{n\to\infty} \lvert\frac{a_{n+1}}{a_n}\rvert > 1$, the series diverges. If $\lim_{n\to\infty} \lvert\frac{a_{n+1}}{a_n}\rvert = 1$, inconclusive.	$\sum_{n=1}^{\infty} \frac{2^n}{n!}$