TABLE 1. Most Important Series

Geometric Series	$\sum_{n=0}^{\infty} r^n$	convergent to $\frac{1}{1-r}$ if $-1 < r < 1$ otherwise divergent
Harmonic Series	$\sum_{n=1}^{\infty} \frac{1}{n}$	divergent
***p*-Series**	$\sum_{n=1}^{\infty} \frac{1}{n^p}$	convergent if $p > 1$ otherwise divergent
Alternating Series	$\sum_{n=1}^{\infty} (-1)^{n-1} b_n$	convergent if the b_n are positive, decreasing, and converge to zero
Telescoping Series	$\sum_{n=1}^{\infty} (c_n - c_{n+1})$	convergent if $\lim_{n\to\infty} c_n$ exists otherwise divergent

Table 2. Convergence/Divergence Tests for Series

Test for Divergence	If $\lim_{n\to\infty} a_n \neq 0$, then $\sum_{n=1}^{\infty} a_n$ diverges
Comparison Test	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 $0 \leq a_n \leq b_n$ and $\sum_{n=1}^{\infty} a_n$ diverges, then $\sum_{n=1}^{\infty} b_n$ diverges
Limit Comparison Test	If a_n and b_n are positive and $0 < \lim_{n\to\infty} \frac{a_n}{b_n} < \infty$, then $\sum_{n=1}^{\infty} a_n$ and $\sum_{n=1}^{\infty} b_n$ either both converge or both diverge
Integral Test	If f is continuous, positive, and decreasing and $a_n = f(n)$, then $\sum_{n=1}^{\infty} a_n$ and $\int_1^{\infty} f(x)\mathrm{d}x$ either both converge or both diverge
Ratio Test	Put $L := \lim_{n\to\infty} \left\lvert \frac{a_{n+1}}{a_n} \right\rvert$. The series $\sum_{n=1}^{\infty} a_n$ is divergent if $L > 1$ and absolutely convergent if $L < 1$
Root Test	Put $L := \lim_{n\to\infty} \sqrt[n]{\lvert a_n \rvert}$. The series $\sum_{n=1}^{\infty} a_n$ is divergent if $L > 1$ and absolutely convergent if $L < 1$