***INFINITE SERIES AND CONVERGENCE TESTS***

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| is an infinite **series**. Let  be the N-th partial sum. Then the *series*  converges if the *sequence*  converges, and diverges if that sequence diverges. | |
| **Geometric Series:**   * If  the series converges to * If  the series diverges   Example: | **Harmonic Series:**  The harmonic series, strangely enough, diverges.  Example: |
| **p-Series:**   * If  the series converges * If  the series diverges   **Example:**  converges | **Telescoping Series:** A series where adjacent terms cancel out. Involves  as a difference of two terms, sometimes as a result of Partial Fraction Decomposition.  **Example:** |
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| **Divergence Test**: If  then diverges  **Example:**  diverges | **Limit Comparison Test**: If  and  are two sequences such that  exists and is not zero, then the two series  and  are comparable, i.e. they either both converge or both diverge.  **Example:**  and  both converge |
| **Ratio Test**: For  and compute   * If  the seriesconverges * If  the series  diverges * If  there is no information   **Example:**  converges | **Integral Test:** Suppose  is decreasing and. Let  be a function such that . Then  converges if and only if  converges.  **Example:**  and  both diverge |