Math 351: class discussion, 24 October 2018



Series: Ratio test, root test, asymptotic convergence test, absolute convergence, cauchy’s theorem, rearrangements

Continuation: Numerical series

1. Review the series (a) $\sum\_{n=1}^{\infty }\frac{1}{n}$ and (b) $\sum\_{n=0}^{\infty }r^{n}$ for |r| < 1
2. What is meant by a “telescoping series”?
3. What is the **Cantor set**?
4. **Review:** Define conditional convergence; absolute convergence; alternating series
5. **Review: Prove** that absolute convergence implies convergence. Is the converse true?
6. State and prove the **Ratio test** for series.
7. State and prove the **Integral test** for positive series.
8. State and prove the **nth root test** for series.
9. State and prove the **Asymptotic Comparison Test.**
10. State and prove **Cauchy’s test** for conditional convergence of an alternating series.
11. What is a **rearrangement** of a series?
12. State and prove the **rearrangement theorems**.

**7A-1** For each of the following series, determine convergence or divergence? Justify your answer. If the series converges, find its sum. 







**Challenge problems:** Stewart, Calculus

**1.**





**2.**



**3**. Sum the series



**4.** A sequence $\left\{a\_{n}\right\}$ is defined recursively by the equations



**5.**





**6.** Right-angled triangles are constructed as in the figure. Each triangle has height 1 and its base is the





*The notion of infinity is our greatest friend; it is also the*

*greatest enemy of our peace of mind.*

* James Pierpont



*Constructing the Cantor set*



