

10.1 Defining Convergent and Divergent Infinite Series

Calculus

Name: _____

CA #1

1. **Calculator active.** Given the infinite series: $1 + \frac{1}{4} + \frac{1}{9} + \frac{1}{16} + \frac{1}{25} + \dots$, find the sequence of partial sums S_1, S_2, S_3, S_4 , and S_5 .

2. Find the n th partial sum for the infinite series $\sum_{n=1}^{\infty} \frac{1}{5^n}$.

3. The infinite series $\sum_{n=1}^{\infty} \frac{3}{4^{n+1}}$ has n th partial sum $S_n = \frac{1}{4} - \frac{1}{4^{n+1}}$. What is the sum of the series?

4. If the infinite series $\sum_{n=1}^{\infty} a^n$ has n th partial sum $S_n = \frac{4}{3}(4^n - 1)$ for $n \geq 1$. What is the sum of the series?

5. Does the series $\sum_{n=1}^{\infty} \left(\frac{1}{2n-1} - \frac{1}{2n+1} \right)$ converge or diverge? If it converges find its sum.

1. 1, 1.25, 1.3611, 1.4236, 1.4636	2. $S_n = \frac{4}{3} \left(1 - \frac{1}{5^n} \right)$	3. $\frac{4}{3}$	4. Diverges	5. Converges, sum = 1
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