

MAT 137 (Calculus II) Prof. Swift

Worksheet on Finite and Infinite Geometric Series

1. Let $s_9 = \sum_{n=0}^9 \left(\frac{2}{3}\right)^n$. Write out s_9 , using “dot dot dot”. Compute $s_9 - \frac{2}{3}s_9$, canceling as many terms as possible, and simplify the expression. Solve for s_9 .

2. Use a similar technique to find and simplify $s_n = \sum_{i=0}^n \left(\frac{2}{3}\right)^i$.

3. Sum the series (i.e. the infinite series) by completing the sentence. Fill in your answer to part 2 for s_n , and then evaluate the limit, using common sense.

$$\sum_{n=0}^{\infty} \left(\frac{2}{3}\right)^n = \lim_{n \rightarrow \infty} s_n = \lim_{n \rightarrow \infty} \quad =$$