

408L CLASS PROBLEMS

APRIL 3RD, 2020

Problem 1.

(1) Find $\sum_{n=1}^{\infty} \frac{1}{2^n} = \frac{1}{2} + \frac{1}{4} + \frac{1}{8} + \dots$

(2) Draw a segment of length $\frac{1}{2}$, then one of length $\frac{1}{2} + \frac{1}{4}$, then one of length $\frac{1}{2} + \frac{1}{4} + \frac{1}{8}$. How do these pictures relate to your answer to (1)?

Problem 2. Find $6/5 + 18/25 + 54/125 + 162/625 + \dots$

Problem 3. Find $.99999\dots = \sum_{n=1}^{\infty} 9 \cdot (\frac{1}{10})^n$ by evaluating the geometric series.

Problem 4. Find¹ $\sum_{n=2}^{\infty} \frac{1}{n^2-1}$.

¹The sum begins at 2 not to be tricky, but to avoid dividing by zero.