MATH 242 — 5 November 2025

THE RIEMANN ZETA FUNCTION

$$\zeta(s) = \sum_{n=1}^{\infty} \frac{1}{n^s} = \frac{1}{1^s} + \frac{1}{2^s} + \frac{1}{3^s} + \frac{1}{4^s} + \frac{1}{5^s} + \cdots$$

GROUP CHAT:

1. What did Riemann hypothesize in his 1859 paper?

   The (nontrivial) zeros of $\zeta(s)$ have complex part $\frac{1}{2}$.

2. How do the zeta zeros relate to the prime numbers?

   The zeta zeros can be used to build a function that converges to the prime counting function

Complex plane