Math 242 Reading Guide

The Zeta Function and the Riemann Hypothesis

NAME

Read "The Riemann Hypothesis, explained" by Jørgen Veisdal, at `https://medium.com/cantors-paradise/` `the-riemann-hypothesis-explained-fa01c1f75d3f`.

Then answer the following questions. *Your answers are due at the beginning of class on Friday and will not be accepted after that.*

1. What is the zeta function?

2. What connection did Euler make between the zeta function and prime numbers?

3. What is the Prime Number Theorem? State the theorem as a limit, and also say what it means in words.

4. Riemann used the technique of *analytic continuation* to extend the zeta function to the entire complex plane. This produces the Riemann zeta function, which has two types of zeros.

   (a) Where are the *trivial zeros* of the Riemann zeta function?

   (b) What does the Riemann Hypothesis say about the non-trivial zeros?