

Senior Thesis Proposal

Name: Bernhard Riemann

Major + 2: Mathematics Major, German Minor, Latin GEC.

Proposed Topic: I want to work in number theory. In particular, I want to study functions which might help in understanding the distribution of prime numbers. I have a hypothesis, which I will expand in the narrative portion of this proposal.

My thesis proposal is mathematics only.

I am considering the following thesis option(s):

- fall one-semester
- two-semester honors (I would prefer this option, but if I do one semester only I would rather it be the Fall semester because I will be busy in the Winter with a German theater course)

Potential Advisor(s) (all relevant fields): Carl Friedrich Gauss (Mathematics Department)

Courses I have had which support my thesis proposal:

1. Real Analysis (Math 309)
2. Complex Analysis (Math 308)
3. Abstract Algebra (Math 301)
4. Topology (Math 313)
5. Number Theory (Math 225)

Proposal

[Explain here, in detail, what you plan to work on. The very brief example below shows how to cite references.]

[THIS SECTION SHOULD BE 2-3 PAGES LONG.]

This project came from discussing with Dr. Gauss about the distribution of prime numbers. Does the distribution follow some pattern, or is it completely random? Dr. Gauss suggested I look at functions of complex variables. My main resource for complex analysis is the book by Churchill and Brown [1].

Interesting results have been found by Jacques Hadamard in [2].

References

- [1] James Ward Brown, Ruel V. Churchill. *Complex Variables and Applications*. Seventh Edition, McGraw Hill, 2004.
- [2] Jacques Hadamard. *Sur la distribution des zéros de la fonction $\zeta(s)$ et ses conséquences arithmétiques*, Bulletin de la Société Mathématique de France **14** (1896) pp 199–220.