

Homework #1 for MATH 5374: Introduction to Topology

September 7, 2018

Due Date: Friday 14 September in class.

For problems 1 and 2, write three different versions of the proof:

- The first should be careful, formal, and up to the standards of mathematical proof-writing.
- The second should be colloquial, as if you were explaining the argument to a friend in this class.
- The last should be an explanation your parents can understand.

Problems 3 through 7 are not going to be graded, but I would appreciate your answers anyway.

1. Prove that there are infinitely many prime numbers.
2. Let $f(x)$ be a polynomial. Prove that there is a number n with the property that the n^{th} derivative of $f(x)$ is zero.
3. What has been your favorite class at university?
4. What has been the most exciting thing you've learned in a math class?
5. What do you want or intend to do after graduation?
6. Do you have any concerns or worries about this class that you want me to know about?
7. What do you want to get out of this class?