Syllabus for MTH 2800
Writing Mathematical Proofs
Spring 2015
Qun Li

• Goals:
Upon completion of this course, the student will be able to
1. Read and understand mathematical definitions and proofs.
2. Express mathematical ideas precisely.
3. Construct mathematical proofs.
4. Follow accepted guidelines when writing mathematical proofs so that the ideas can be clearly understood by the reader.

• Reference:

• Tentative topics and practice problems (Topics are subject to change upon request):
Chapter 1–Logic and Proofs
S1.1: Propositions and Connectives; 2, 3, 6, 7, 9, 11, 12;
S1.2: Conditionals and Biconditionals; 1, 2, 5, 6, 7, 10, 12;
S1.3: Quantifiers; 1, 6, 8, 9, 10, 11, 13;
S1.4: Basic Proof Methods I; 5, 6, 8, 9, 10, 11;
S1.5: Basic Proof Methods II; 3, 4, 6, 7, 10, 11, 12;
S1.6: Proofs Involving Quantifiers; 1, 2, 4, 5, 6, 7.

Chapter 2–Set Theory
S2.1: Basic Concepts of Set Theory; 1, 5, 6, 12, 14, 15, 19;
S2.2: Set Operations; 1, 3, 5, 10, 11, 13, 18;
S2.3: Extended Set Operations and Indexed Families of Sets; 1, 6, 8, 11, 15, 16, 18;
S2.4: Mathematical Induction; 2, 5, 6, 7, 8, 13;
S2.5: Equivalent Forms of Induction; 2, 3, 6, 12, 13.

Chapter 3–Relations and Partitions
S3.1: Cartesian Products and Relations; 1, 4, 5, 6, 7, 13, 15;
S3.2: Equivalence Relations; 1, 2, 5, 8, 12, 13, 19;
S3.3: Partitions; 3, 4, 7, 8, 10, 14, 15;
S3.4: Ordering Relations; 5, 6, 7, 9, 14, 15, 20.

Other topics from Chapter 4 and Chapter 7 if time permits.