Review for Math 290 Midterm 1
The midterm covers the material covered in sections 1.1-5.3 of the textbook.

Definitions to know:
1. Subset (p. 16)  15. Implication (p. 38)
2. Proper subset (p. 18)  16. Biconditional (p. 43)
3. Power set (p. 18)  17. Tautology (p. 45)
4. Union (p. 19)  18. Logical equivalence (p. 47)
5. Intersection (p. 20)  19. Universal quantifier (p. 51)
6. Disjoint (p. 20)  20. Existential quantifier (p. 51)
7. Difference (p. 20)  21. Trivial proof (p. 68)
8. Complement (p. 21)  22. Vacuous proof (p. 69)
10. Cartesian product (p. 26)  24. Divides (p. 87)
11. Statement (p. 33)  25. Multiple (p. 87)
12. Open sentence (p. 34)  26. Congruent modulo $n$ (p. 91)
13. Disjunction (p. 37)  27. Triangle inequality (p. 95)
14. Conjunction (p. 38)  28. Counterexample (p. 107)

You should be able to:
1. Describe sets using 3 different methods.
2. Compute the cardinality of a set
3. Determine subsets
4. Use set operations (union, intersection, difference, complement, etc.)
5. Determine sets using index sets and indexed collections of sets
6. Determine partitions of a set
7. Determine Cartesian product of a set
8. Know when a sentence is a statement or open sentence
9. Determine truth tables for statements
10. Values for which an open sentence is true or false
11. Negate sentences
12. Determine when a statement is a tautology or contradiction
13. Determine logical equivalence
14. Write sentences using quantifiers
15. Translate quantified statement to English
16. Negate quantified statements
17. Determine trivial and vacuous proofs
18. Prove by direct proof
19. Prove by contrapositive
20. Prove results using cases.
21. Prove properties involving divisibility
22. Prove results on congruence of integers
23. Prove results on real numbers
24. Prove results of sets
25. Find a counterexample and prove it is a counterexample
26. Prove a result by contradiction
27. Prove results directly, by contrapositive, and contradiction