MthSc 119 — Test #1 Outline

1. Integers
   1. divisibility
   2. prime
   3. composite

2. Statements
   1. if-then
   2. if and only if
   3. and, or, not

3. Proofs and Counterexamples
   1. if-then statements
   2. if and only if statements

4. Boolean Algebra
   1. operations
   2. truth tables
   3. logical equivalence
   4. properties
   5. tautology

5. Lists
   1. multiplication principle
   2. counting: with and without repetition
   3. factorials

6. Sets
   1. Venn diagrams
   2. cardinality
   3. inclusion-exclusion principle
   4. subsets
   5. power set
   6. set operations
      1. union, intersection
      2. difference, symmetric difference
      3. Cartesian product
   7. properties
      1. associative, commutative, distributive
      2. others
   8. proofs of A ⊆ B and A = B
      1. showing set containment
      2. using logical operations
      3. using Venn diagrams

7. Quantifiers
    1. exists (there is)
    2. for all (every)
    3. compound statements
    4. negations

8. Relations
    1. subsets of Cartesian product
    2. reflexive, irreflexive, symmetric, antisymmetric, transitive
    3. inverse relation
    4. equivalence relations
        1. examples: modular arithmetic
        2. reflexive, symmetric, transitive
        3. partitions
        4. equivalence classes