

1. Logic, statements
2. $\forall, \wedge, \sim, \Rightarrow, \Leftrightarrow$ and truth tables.
3. \forall, \exists
4. Negating statements involving all of the above, symbolically and in English.
5. Contrapositives, converses, inverses, and negations of if/then statements.
6. Sets, subsets, \cup, \cap , complements, generalized unions and intersections, Venn diagrams.
7. Cartesian products of sets.
8. Power sets
9. Relations (by def. a subset of cartesian product)
 - (a) Relations from a set A to a set B , use the analogy to functions – one to one and onto relations
 - (b) Relations on a set A , reflexive, symmetric, antisymmetric, transitive, equivalence relations, partial order relations. What does it mean to be totally ordered? What does it mean to be well ordered?
10. Functions, one to one, onto, inverses.
11. Composition of functions and its relation to the above.
12. The sets S_n , how to represent a function in cycle notation and how to compute the composition in cycle notation.
13. Binary operations and their properties (commutativity, associativity, having an identity and inverses), Cayley tables.
14. Mathematical induction