

Math 243
Test 1 review

- 1.2.** Know what sets and elements are, and what the empty set it.
- 1.3.** Be able to describe a set using “set notation”, and be able to interpret such notation.
- 1.4.** Know what subsets are, and understand the union, intersection, and difference operations. Be able to draw Venn diagrams of sets as in Exercises 1.4.(8-11).
- 1.5.** Know what values, expression, and literals are in the context of ML programming. Understand what a type is and what type agreement means.
- 1.6.** *Be able to verify propositions using Venn diagrams as in Exercises 1.6.(1-8).*
- 1.7** *Be able to write simple ML functions as in this and later chapters.*
- 1.9.** Know the terms universal set, complement, cardinality, pairwise disjoint, and partition. Be able to identify and use the notation for complement and cardinality.
- 1.10 & 11.** Understand how ML lists work, with their synthetic and and analytic operations. *Be able to do a type analysis on expression containing lists and other types from later chapters, as in Exercises 1.9.(1-5) and on page 22. Be able to write ML functions on list using pattern-matching as in Exercises 1.10.(1-7).*
- 1.11.** Understand Cartesian products and ML tuples. Make sure you have the notation correct on the math side of things, and make sure you understand how tuple types work.
- 1.12.** Know what powersets are and be comfortable with the idea of a set of sets. Pay careful attention to the notation.
- (Nothing appearing only in Sections 1.13-15 will be covered by the test.)
- 2.1 & 2.** Know the difference between propositions and terms. Know the basic logical operations.
- 2.3.** Be familiar with the ML bool type.
- 2.4.** Understand how truth tables work. *Be able to verify logical equivalences using the laws in Theorem 2.1.* You do not need to memorize the names of the laws; I will provide a reproduction of Theorem 2.1 for you on the test. However, you should be pretty familiar with it, or else searching the table will take too much time.
- 2.5 & 6.** Understand the formal definition of the conditional. *Be able to use conditional expressions in ML to write functions as in Exercises 2.6.(4-12).*
- 2.7.** Know the terms converse, inverse, and contrapositive. Be able to determine the converse, inverse, and contrapositive of a give conditional proposition.
- 2.9 & 10.** Know the eight basic syllogisms (modus ponens, modus tollens, generalization specialization, elimination, transitivity, division into cases, and contradiction). Unlike Theorem 2.1, these will not be provided for you; you must have these memorized. *Be able to use them to verify arguments as in Exercises 2.10.(1-9).*
- 2.11-14.** Be able to identify the quantification, including multiple quantification. Be able to write ML functions whose operation is based on quantification. (No question on the test will require nested helper functions in a let expression.)