

MATH 1030: Midterm 1 Study Guide

The following is an overview of the material that will be covered on the first exam.

1. Sets and Venn Diagrams

- The definitions of disjoint sets, subsets, and intersecting sets.
- Making Venn Diagrams (with 3 sets).
- Drawing venn diagrams for categorical propositions.

2. Analyzing Arguments

- Identifying inductive and deductive arguments.
- Evaluating the strength of an inductive argument.
- Evaluating the validity and soundness of deductive arguments.

3. Unit Conversions

- Memorize the following conversion factors
 - 1 inch = 2.54 cm
 - 1 mile = 1.60 km
 - 1 kg = 2.2 lb
 - 1 gal = 3.785 Liters
 - Conversion between Celcius and Fahrenheit: $F = 1.8C + 32$
- Memorize the table of common metric prefixes. This is table 2.5 on page 99.
- Be able to do unit conversion problems
- Know how to deal with units raised to powers (i.e. converting ft^2 to m^2)
- Currency conversion problems.
- Know what energy and power are, and know how to do unit conversion problems of this type.
- Know how to calculate concentrations and dentsity (e.g. blood alcohol content or population density)

4. Percentages and Ratios

- Using percentages as fractions.
- Using percentages to describe change. This includes knowing the formulas for absolute and relative change.
- Using percentages for comparisons. Know the formulas for absolute and relative differences.
- Be able to do problems with percentages of percentages. Remember that absolute differences are expressed in percentage points while relative differences are expressed as a percent.

- In all problems involving percentages of percentages, take *extreme* care to read the problem carefully. Read it at least two or three times and be sure you understand what relationships are being claimed. For example “Newspaper readership is now 90%, up 50% from the previous year.” In this statement, 50% is not an absolute change, it is a relative change. Moreover, the reference value (the value to which this change is being compared) is not 90% but is the percent of the population that read the paper in the previous year!!

5. Large and small numbers

- Convert between scientific and standard notation.
- Add, subtract, multiply, and divide numbers in scientific notation.
- Make approximations to get an order of magnitude estimate.