

## Study Guide for Final

This exam covers chapters 8 through 10, sections 11.1 through 11.3, chapter 12, and sections 13.1 and 13.2.

Overall, make sure you understand the topics and problems below and all homework problems. You need to be able to explain the concepts, not just work problems.

## Algebraic Reasoning and Representation

- Understand the concept of function, domain, and range.
- There are five ways to represent a function. Be able to use these.
  - as a formula
  - as a table
  - as an arrow diagram
  - as a machine
  - as a graph
- Be able to prove the distance formula.
- There are 3 forms for the equation of a line to know.
  - point-slope form
  - slope-intercept form
  - 2-point form

## The Graphical Representation of Data

- Know how to use the 7 graphical representations of data. Know what type of data is appropriate for each representation.
  - Dot Plots
  - Stem and Leaf Plots
  - Histograms
  - Line Graphs
  - Bar Graphs
  - Pie Charts
  - Pictographs
- Be able to calculate the measures of central tendency and be able to determine if you answer is a good approximation for the data.

- mean
- median
- mode
- Know how to calculate variability and explain what the answer means with respect to the data.
  - Upper and Lower Quartile
  - Standard Deviation
  - Outlier
- Understand the difference between a population and a sample.
- Be able to calculate and interpret z-score and percentile.

## **Probability**

- Be able to calculate and define empirical probability.
- Be able to recognize independent events and mutually exclusive events.
- Know how to use the Addition Principle of Counting to determine probability.
- Know how to use the Multiplicative Principle of Counting to determine probability, in particular understand 2-stage experiments.
- Be able to use and recognize permutations and combinations.
- Recognize when to use complementary events.
- Be able to compute expected value.

## **Geometric Figures**

- Be able to explain the concepts of point, line, and plane to your elementary school students.
- Understand how to determine the interior of a simple closed curve.
- Be able to identify and know the names of polygons and polyhedrons.
- Know the difference between concave and convex.
- Be able to use the formula to determine the sum of the interior angles of a polygon.
- Define regular polygon and regular polyhedron.
- Use Euler's Formula.

## Measurement

- Know the metric prefixes.
- Be able to compute perimeter.
- Be able to use and prove formulas for area and surface area.
- Know and be able to use the formulas for volume.

## Transformations, Symmetries, and Tilings

- Be able to use the four basic rigid motions.
  - Translation
  - Rotation
  - Reflection
  - Glide Reflection
- Be able to use similar figures to determine length, area, or volume measurements.
- Be able to identify the types of symmetry and understand the definition of symmetry.
  - Reflection Symmetry
  - Rotation Symmetry
  - Point Symmetry
  - Translation Symmetry (Pattern)