

Final Exam will be given on Friday, December 12, from 4pm to 6pm, and will be composed of problems similar to those listed below. All problems listed below are taken from the textbook: *Reconceptualizing Mathematics* by J. Sowder, L. Sowder, S. Nickerson, 2nd edition. All problems are from Learning Exercises expect the ones marked SLE, which are from Supplementary Learning Exercises.

Final Exam will be composed of 50 questions total, each worth 2 points. They will be grouped into different problems. Final Exam will be cumulative and will cover Chapters 27–33 as well as Chapter 12.

All class materials, including all homework and test solutions (Test 3 and Homework 6 solutions will be added shortly), are posted here:

www.mamatelashvili.com/2870-145-math-for-elementary-education.html

Office hours (Parker 334)

- I will hold regular office hours during the last week of classes (December 1–5):
Monday and Wednesday 11-12; Tuesday and Thursday 3:30-4:30.
- I will hold additional office hours during the finals week (December 8-12):
Monday and Wednesday 11-1.

Main concepts

Below is the list of the main concepts we have covered this semester. Be prepared to explain and interpret following concepts. Wherever relevant, be prepared to give examples.

- Experiment, sample space, outcome, event;
- Experimental and theoretical probabilities;
- Disjoint events, independent events, conditional probability;
- Population, sample, representative sample, biased sample;
- Sample statistic, population parameter;
- Sampling methods: self-selected/voluntary sampling, convenience sampling, simple random sampling, stratified random sampling, systematic sampling and cluster sampling;
- Categorical and measurement data;
- Statistical variable;
- Range, nth percentile, quartiles, outliers;
- Measurements of the center: median, mean, mode;
- Average deviations, variance, standard deviation;
- Positive correlation and negative correlation;
- Rule of thumb ($1/\sqrt{n}$), confidence intervals and confidence levels;
- Expected value, permutations, combinations, Fundamental Counting Principle;
- Algebra as symbolic language: properties of real numbers;
- Polynomials;
- Arithmetic sequences.

Main topics

Below is the list of the main topics we have covered this semester. Be prepared to solve problems similar to those listed below.

- Experiments:
 - ♣ Section 27.1: 1, 4, 5;
 - ♣ Section 27.2: 4, 5, 6, 9, 13, 15, 17, 18, 19, 22, 24, 26.
- Simulations:
 - ♣ Section 27.3: 1, 2, 5.
- Tree diagrams:
 - ♣ Section 28.1: 2, 7.
- "and" and "or" probability calculations:
 - ♣ Section 28.2: 2, 3, 10.
 - ♣ Section 28.3: 1, 3, 6, 7.
- Conditional probability:
 - ♣ Section 28.4: 2, 9, 11.
- Sampling:
 - ♣ Section 29.1: 1, 2, 3.
 - ♣ Section 29.2: 1, 3, 4, 5, 7, 8.
- Simulating random sampling:
 - ♣ Section 29.3: 3, 5, 6, 7.
- Types of data:
 - ♣ Section 29.4: 1, 2, 3.
- Representing Categorical Data:
 - Pie charts and Bar graphs:
 - ♣ Section 30.1: 2, 3, 7, 8, SLE 1a,b, SLE 4.
- Representing Measurement Data:
 - Stem-and-leaf plots and histograms:
 - ♣ Section 30.2: 2, 3, SLE 1, SLE 2, SLE 4.
 - Five number summary (detect outliers):

- ♣ Section 30.3: 3, 4, 5, 6, SLE 5.
 - Measurements of the center:
- ♣ Section 30.4: 1, 3, 11, 13, SLE 2.
 - Mean and deviations:
- ♣ Section 30.5: 1, 2, SLE1.
- Comparing data sets:
 - ♣ Section 31.1: 3, 4, 5, 6, 9.
- Correlation coefficient and lines of best fit:
 - ♣ Section 31.2: 1, 2, 5.
- Confidence intervals and confidence levels:
 - ♣ Section 32.1: 2, 3, 6, 7, 9, 11.
 - ♣ Section 32.2: 1, 4, 5.
- Expected value:
 - ♣ Section 33.1: 3, SLE 4, SLE5.
- Permutations and combinations:
 - ♣ Section 33.2: 1, 2, 5, 6, 7, 8, 10, 12, SLE8, SLE9.
- Identification and use of properties of real numbers:
 - ♣ Section 12.1: 4, 6, 7, 8, 10, 13, 14, 15.
- Similarities between arithmetic and algebraic operations:
 - ♣ Section 12.2: 3, 5, 6, 7, 8, 10.
- Detecting and extending patterns:
 - ♣ Section 12.3: 1, 3, 4, 5, 8, 9, 10.