EXAM 1 INFORMATION

MATH 262, Spring 2026

Exam 1 will consist of an in-class portion on Friday, March 6, and a short take-home portion, distributed on Wednesday, March 4 and due at the exam time on March 6. The exam will test your knowledge of concepts, definitions, and theorems, as well as your ability to solve simple problems involving counting and probability, from Sections 1.1 through 1.5 and 2.1 through 2.4 in the textbook.

Take-Home

The take-home portion of the exam will contain a few problems similar to the homework problems in this course. For this part of the exam, you may refer to your own notes, materials that the professor has posted on the course web site, the textbook, and computational technology (e.g., *R*, *Mathematica*, *Wolfram Alpha*, a calculator). **Do not consult other people, artificial intelligence, web sites, books, etc.** The St. Olaf Honor Code applies to this exam.

In-Class

The in-class portion of the exam will focus on the concepts, definitions, and theorems that we have studied. Books, notes, and internet-capable devices will not be permitted during the in-class exam. Calculators will be allowed, but probably not very useful, since the problems will not require much calculation, and it will not be necessary to simplify arithmetic. For example, you could leave an answer as $0.45(0.2 + 0.36)$ without simplifying this to 0.252.

Concepts and Theorems

You should be able to define, illustrate, use, and briefly summarize the following:

- sample space
- event
- probability (definition, 3 axioms)
- inclusion-exclusion principle
- fundamental counting principle
- combination
- permutation
- selection with or without replacement
- counting when order does or does not matter
- conditional probability
- independent events
- law of total probability
- Bayes' rule
- random variable (rv)
- discrete random variable
- probability distribution
- probability mass function (pmf)

- cumulative distribution function (cdf)
- expected value, mean
- variance, standard deviation
- Chebyshev's inequality
- Bernoulli random variable
- Binomial random variable

Problems to Review

Consider the following problems for practice, especially those printed in ***bold****.*

- Section 1.7: #121 – 127, 129, **131**, 132, 134, 135, **136**, 141, 142, **143**, 146 – 148 (pages 60 – 66)
- Section 2.1: #1, 2, 8, **9** (pages 70 – 71)
- Section 2.2: #**11**, 12, 14, 15, **17**, 19, 21, **23**, 25, 27 (pages 79 – 82)
- Section 2.3: #30, 31, **38**, **39**, 40, 45 (pages 91 – 95)
- Section 2.4: #53, **61**, 67, **69**, 71 (pages 102 – 106)
- Section 2.9: #142, **143**, **145**, 146, 148, 150, 152, 155, **161** (pages 140 – 145)
- Problems from class or assigned in the homework (solutions on the course web site).