

# EXAM 1 INFORMATION

Math 262, Fall 2020

Exam 1 will be distributed on Wednesday, September 16 and due at class time on Monday, September 21. 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.

During 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 (*R*, *Mathematica*, and *Wolfram Alpha*). If you have questions about the exam, you may ask the professor. **Do not consult other sources, people, web sites, etc.** The St. Olaf Honor Code applies to this exam.

## 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 73 – 80)
- Section 2.1: #1, 2, 8, **9** (pages 85 – 86)
- Section 2.2: #**11**, 12, 14, 15, **17**, 19, 21, **23**, 25, 27 (pages 96 – 100)
- Section 2.3: #30, 31, **38**, **39**, 40, 45 (pages 111 – 116)
- 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).