**Math 30530, Fall 2015**

## Review for Exam 2

The exam is Wednesday, November 4 in 112 Pasquerilla starting at 2 (the usual time) and ending at 3:10. There will be a review session Sunday, November 1, at 5 p.m. in 116 DBRT. Exam 2 will cover everything we have done/will have done in chapters 4–6: §§4.1-4.2 and chapters 5 and 6. Of course this material builds on the earlier material. On the exam you may use a summary (one side of an $8\frac{1}{2}'' \times 11''$ sheet of paper, with notes in your writing) and your own calculator (which you don't need for the exam). I will provide the table for the normal distribution as part of the exam.

Here is an outline of the major topics we covered.

1. Conditional probability
    - Discrete and continuous cases
    - Bayes' formula
    - Independent events
    - Joint distribution functions (discrete case)
    - Joint density and cumulative distribution functions (continuous case)
    - Independent random variables
    - Independent trials process
2. Specific types of discrete random variables
    - Bernoulli random variable
    - Binomial random variable
    - Poisson random variable
    - Geometric random variable
    - Negative binomial random variable
    - Hypergeometric random variables
3. Specific types of continuous random variables
    - Uniform density
    - Exponential density
    - Normal density
    - Beta density

- Gamma density

4. Functions of a random variable
5. Expected value for discrete and continuous random variables
    - Also called mean or expectation
    - $E(X+Y)$
    - $E(cX)$
    - $E(\phi(X))$
    - $E(XY)$ if $X, Y$ are independent
    - Conditional expectation
6. Variance
    - $V(cX)$
    - $V(X+c)$
    - $\mathrm{V}(X+Y)$ if $X, Y$ are independent
    - Standard deviation