FINAL EXAM REVIEW SHEET - MAC 1147

The final will cover the material from Chapters 6, 9 and 10 and section 7.3 in your text, with a limited number of exceptions (see bottom of sheet). This sheet is to provide you with some guidance during your study, but does not include every detail. As a general rule, any homework problem, section of the text (again, see below for a couple of exceptions), set of lecture notes, and in-class exercise is a valid topic for the material covered on the exam.

There will be no multiple choice or true-false. Calculators will be allowed, but you must show all your work for full credit. I will have special office hours on Tuesday, December 7 3-5pm. If you have questions or comments, please contact me.

CHAPTER 6

- Polar Coordinates
  - Representing Points with Polar Coordinates
  - Converting Points back and forth with Rectangular Coordinates
  - Converting Equations back and forth with Rectangular Coordinates
- Graphing Polar Equations (Make sure you show how you came up with your graph - points, symmetry, recognition of formula as a type of picture, etc. Also, make sure to label key values on the axes.)
- Complex Numbers
  - Absolute Value/Magnitude
  - Polar Form of Complex Numbers/Converting back and forth with Rectangular Form
  - Products: rectangular and polar forms
  - Quotients: polar form
  - Powers: DeMoivre's Theorem
- Vectors
  - Magnitude
  - Addition, Subtraction and Scalar Multiplication, including in combination
  - Unit, Zero, and Standard Basis ($\vec{i}, \vec{j}$) Vectors
  - Find a Unit Vector in the same direction as a given vector
  - Writing a Vector in terms of Magnitude and Direction Angle

CHAPTER 7

- Do a partial fraction decomposition for linear terms (including distinct and/or repeated terms)
- Write out the general partial fractions decomposition when there are non-factorable quadratic terms, BUT do not solve for the constants

CHAPTER 9

- Graph a conic section, including ones not centered at the origin (given it is an ellipse, hyperbola, or parabola)
- Identify the foci (or focus) and vertices (or vertex) of a conic section (given it is an ellipse, hyperbola, or parabola)
- Given the foci and vertices, find the standard form of an ellipse
- Given the foci and vertices, find the standard form of a hyperbola

- Convert an equation of a given conic section into standard form by completing the square on the appropriate variables (or variable)
- Convert parametric equations to a rectangular equation by eliminating the parameter
- Graph the plane curve from given parametric equations, and use arrow(s) to show orientation of the curve.
- Given a rectangular equation, write two different sets of parametric equations

CHAPTER 10

- Write the first few terms of a sequence, based on a general term, or a recursion formula
- Find a sum using summation (sigma) notation
- Know the general term of an Arithmetic Sequence
- Find the sum of the first *n* terms of an Arithmetic Sequence
- Know the general term of a Geometric Sequence
- Find the sum of the first *n* terms of a Geometric Series
- Find the sum of an infinite Geometric Series, or explain why it does not exist
- Evaluate a binomial coefficient
- Use the Binomial Theorem to expand $(a + b)^n$
- Find a particular term in the binomial expansion
- Use the Principle of Mathematical Induction to prove a statement is true for all positive numbers *n*

EXCLUSIONS FROM TEXT(section of text where it appears)

- Symmetry tests for polar equations (but may be useful in graphing) (6.4)
- Types of polar graphs (lemniscate, n-leaved rose, etc.) (but knowing which it is could help with graphing) (6.4)
- Roots of Complex Numbers (6.5)
- Force as a Vector; Resultant Force (6.6)
- All of sections 6.1-6.2, 6.7
- Applications of conic sections (9.1-9.3)
- All of sections 9.4, 9.6
- All of sections 10.6-10.7