MATH 1523

The Top 40 Things to Know for Exam #3

(Disclaimer: this is not necessarily a complete list, but is a good place to start!)

1) How to convert complex numbers to complex polar form (finding $r$, the absolute value; and $\theta$)
2) DeMoivre’s Theorem: using the power formula and the root formula
3) Multiplying and dividing complex numbers in polar form
4) How to find the magnitude of a vector
5) Working with vectors in $i,j$ form and in bracket form
6) Finding the component form of a vector given two points (pg. 70 2B)
7) Operations with vectors/vector arithmetic
8) How to put sums of vectors in equilibrium
9) Calculating the dot product
10) Finding the angle between two vectors; and finding the direction angle of a vector (and adjusting for the appropriate quadrant)
11) Determining if two vectors are orthogonal or parallel
12) Solving application problems with vectors (including problems about work)
13) Vector projections and how to determine which formula to use based on how the problem is worded
14) How to use the standard form of the equation of an ellipse to find basic features (center, orientation, vertices, x radius, y radius, major axis, minor axis, focus points)
15) How to use any of the above features of an ellipse to figure out the equation (in standard form) and other features
16) How to use the standard form of the equation of a parabola to find basic features (vertex, orientation, directrix, focus point, latus rectum, axis of symmetry)
17) How to use any of the above features of a parabola to figure out the equation (in standard form) and other features
18) Application problems for conic sections (for ellipses, parabolas, and hyperbolas)
19) Converting conic section equations to standard form (including completing the square)—see workbook pg 74 CD, pg 76 CD, and quiz #6 problems 2, 5, 8 for examples
20) How to graph conic sections in polar coordinates on your calculator
21) The standard form of an equation for conic sections in polar coordinates
22) Knowing what $e$ and $p$ mean for conic sections in polar coordinates and how to find them
23) How to determine which conic section is represented using eccentricity
24) How to evaluate terms in a regular sequence and in a recursive sequence (example: Fibonacci sequence)
25) Formula for the sum of the first $n$ numbers (remember the Gauss story)
26) Summation notation: how to write a sum in this notation and how to expand a sum given this notation
27) Basic properties of sums that will help you in evaluating sums
28) How to evaluate sums (workbook pg. 83 F,G)
29) Definition of factorial (example: $n!$)
30) Definition of an arithmetic sequence
31) Finding the common difference of an arithmetic sequence (and when it is positive or negative)
32) The formula for finding the general term of an arithmetic sequence
33) Evaluating sums of arithmetic sequences
34) Application problems with arithmetic sequences
35) Definition of a geometric sequence
36) Finding the common ratio of a geometric sequence
37) The formula for finding the general term of a geometric sequence
38) Evaluating partial and infinite sums of geometric sequences using the respective formulas
39) Knowing when an infinite geometric sum converges, and when it diverges $(|r|<1)$
40) Application problems with geometric sequences (including how to use the interest formulas)

Additionally, you have lots of other resources to study for this exam: office hours, two exam reviews, practice exams, and MyMathLab. Find information about all of these on the course website, http://math.ou.edu/~jcook/.