"Have-to-Know" for the Final Exam

1. Quadratic formula

2. Formats of the different possible Partial Fraction Decompositions (and then the process after that).

3. Arithmetic Sequence

    a. Recursive formula
    b. Explicit formula
    c. Sum of the 1st 'n' terms formula
    d. How to determine if it is an arithmetic sequence
    e. How to determine how many terms are in a finite sequence (given several terms and the last term)
    f. How to determine the common difference
    g. How to find the 'nth' term.

4. Geometric Sequence
    a. Recursive formula
    b. Explicit formula
    c. Sum of the 1st 'n' terms formula
    d. Sum of an infinite series formula
    e. How to determine how many terms there are in a finite sequence (given several terms and the last term)
    f. How to determine if the sequence is geometric

5. Logarithms
    a. Properties of logs
    b. Solving log equations

6. Solving exponential equations
    a. Properties of Exponents
    b. Application problems involving the base 'e' exponential (money, population, radioactivity, cooling)
    c. Sinking fund formula (periodic payment into a savings account)
    d. Compounded interest formulas
    e. Continuous interest formula

7. Inequalities
    a. Solving absolute value inequalities
    b. Solving compound inequalities
    c. Solving Rational inequalities (DO NOT multiply to remove denominators → use properties of equality to make one side of the inequality 'zero' then obtain common denominator to combine into a single fraction (ratio of polynomials). Build a sign chart or table to determine the solution. Remember, you can't include vertical asymptotes in the solution.

8. <u>Matrices</u>
   a. <u>Determinants</u>
   b. <u>Cramer's Rule to solve a system of equations</u>
   c. <u>Finding inverse matrices</u>
   d. <u>Scaler Multiplication, Addition, matrix multiplication</u>
   e. <u>Row operations</u>
   f. <u>Converting a system of equations into a matrix equation</u>
   g. <u>Solving matrix equations using inverse matrices.</u>

9. <u>Functions and their different representations.</u>
   a. Arithmetic operations given a function in (x,y)-pair format
   b. Finding inverse functions
   c. Identifying whether a function is 'one-to-one'.
   d. Transformations of function given in (x,y)-pair format
   e. Arithmetic combinations of functions
   f. Composition of functions

10. <u>Solving systems of non-linear equations</u> (use substitution, visualize the shapes of the graphs of the equations and the possible number of solutions)

11. <u>Polynomials</u>
    a. End-behavior
    b. Finding Zeroes
    c. Synthetic division
    d. Long division
    e. Inequalities

12. <u>Rational Functions</u>
    a. Zeroes
    b. Holes
    c. Vertical asymptotes
    d. Non-vertical asymptotes
    e. Domain/range
    f. How to evaluate behavior very near an asymptote

13. <u>Binomial Theorem</u>
    a. Finding the term with a specific exponent on the variable
    b. Find a specific term (4th term, etc)
    c. Be familiar with the pattern of a binomial expansion
    d. Be able to find the coefficients using either Pascal's Triangle or the 'combination' calculation