Possible Algebra 1 Topics on the Qualifying Exam for Honors Geometry

Linear Expressions and Equations in One Variable
  o Simplify expressions using order of operations
  o Evaluate variable expressions
  o Solve linear equations in one variable
  o Determine if a value is a solution to a linear equation
  o Rearrange formulas to solve for specific variable (literal equations)
  o Write expressions and solve linear equations in one variable to model various situations
  o Solve absolute value equations
  o Solve proportions
  o Solve percent problems, including tax and discount problems
  o Perform rate conversions given a conversion chart
  o Use unit rates to compare values

Linear Inequalities
  o Solve linear inequalities in one variable
  o Use substitution to check solutions to inequalities
  o Write linear inequalities in one variable to model situations
  o Express the solution to a linear inequality as a graph and in interval notation
  o Solve, graph, and write the solution to compound linear inequalities in one variable

Functions
  o Determine if a relation is a function
  o Determine domain and range
  o Evaluate functions
  o Interpret statements that use function notation
  o Move fluidly between graphs, tables, words, and symbols and understand the connections between different representations
  o Combine functions using arithmetic operations and composition of functions
  o Identify the intervals where a function is increasing, decreasing, positive, or negative when given a function represented by a graph or table
  o Sketch the graph of a function when given key features of a function

Arithmetic Sequences
  o Identify, evaluate, and write arithmetic sequences using explicit formulas

Linear Equations and Inequalities in Two Variables
  o Find average rate of change (slope) of functions given ordered pairs, a graph, or a table
  o Interpret the meaning of the rate of change in the context of the problem
  o Graph a linear function given an equation, a table, a point on the line and slope, or x- and y-intercepts
  o Determine if a given point is a solution to a linear equation
  o Write equations of lines in standard form, slope-intercept form and point-slope form
  o Write equations of horizontal and vertical lines
  o Identify and write equations of parallel and perpendicular lines
  o Identify x- and y-intercepts
  o Define variables from a given problem scenario
  o Write and solve an equation given a problem scenario
  o Compare the graphs of two linear functions
  o Graph linear inequalities
Systems of Linear Equations and Inequalities
  o Solve a system of linear equations by graphing, substitution, and elimination
  o Create and solve linear systems based on real-world scenarios (cost-quantity, mixture problems, etc.)
  o Solve systems of linear inequalities in two variables

Matrices
  o Add, subtract, and multiply matrices by a scalar
  o Multiply matrices
  o Evaluate the determinant and inverse of a matrix
  o Solve matrix equations
  o Read and interpret matrices given a matrix and a word problem

Polynomials & Factoring
  o Interpret the meaning of the coefficient, constant, and variable
  o Add, subtract and multiply polynomials
  o Divide polynomials by monomials
  o Simplify expressions with exponents, including negative exponents
  o Factor polynomials (including greatest common factor, factor by grouping, difference of squares, trinomials where $a = 1$ and $a \neq 1$, and polynomials that require more than one technique)

Rational Expressions
  o Simplify rational expressions
  o Multiply and divide rational expressions

Radicals
  o Identify the parts of a radical expression – radical, index, radicand, coefficient
  o Simplify radical expressions (including those with an index other than 2)
  o Perform operations on radical expressions (add, subtract, and multiply)
  o Rationalize denominators with square root monomials

Quadratic Functions
  o Solve quadratic equations by factoring, taking square roots and using the quadratic formula
  o Write and use quadratic equations to solve word problems (including projectile problems)
  o Graph a quadratic function
  o Identify the intercepts, vertex, maximum or minimum, and axis of symmetry on the graph of a quadratic function

Statistics
  o Make a dot plot, frequency distribution table, histogram, or box plot for a set of data
  o Analyze data from dot plots, frequency distribution tables, histograms, and box plots
  o Given a set of data, find the mean, median, mode, and range
  o Determine if the mean or median is the most appropriate measure of center of the data
  o Identify outliers
  o Calculate simple probability