CTY MATHEMATICS SEQUENCE — MASTERY CHECKLIST

ALGEBRA I

Student’s Name: _________________________  Instructor’s Name: _________________________
Site: ____________________  Session: ________________

1. Introductory Concepts
   - evaluate algebraic expressions
   - use the order of operations
   - use exponential notation
   - use commutative, associative, identity, and distributive properties
   - transform expressions by factoring or collecting like terms
   - write algebraic expressions
   - solve equations using formulas

2. Integers and Rational Numbers
   - compare integers
   - compare and graph rational numbers
   - multiply and divide rational numbers
   - apply the distributive property to expressions using integers
   - find the inverse of a sum
   - simplify expressions involving grouping symbols
   - write equations to solve problems
   - use number properties in proofs

3. Equations in one Variable
   - use the addition and multiplication properties of equality to solve equations
   - solve problems using an equation
   - solve equations which contain parentheses
   - clear equations of fractions or decimals
   - solve equations involving absolute value
   - solve proportion problems
   - solve percent problems
   - translate problems into equations and solve

4. Inequalities
   - determine if a number is a solution of an inequality
   - graph inequalities on the number line
   - use addition and multiplication properties of inequalities
   - translate problems into inequalities and solve

5. Exponents and Polynomials
   - multiply and divide using exponents
   - raise a power to a power
   - find the power of a product or a quotient
   - multiply and divide monomials
   - identify and simplify polynomials
   - add and subtract polynomials
   - multiply monomials, special binomials, and polynomials

6. Polynomials and Factoring
   - factor common monomial factors
   - recognize and factor the difference of two squares and trinomial squares
   - analyze trinomials to determine how to factor
   - factor polynomials by grouping
   - use factoring to solve equations

7. Graphs and Linear Equations
   - plot points
   - graph equations and determine if a point is on the graph
   - graph using intercepts
   - find the slope of a line
   - find the equation of a line
   - determine if lines are parallel or perpendicular
   - prove theorems related to slope
   - fit equations to data
8. **Systems of Equations**
- solve systems of equations by graphing
- solve systems of equations by substitution
- solve systems of equations by multiplication-addition
- solve problems using systems of equations
- solve motion, digit, and coin problems

9. **Inequalities and Absolute Value**
- find intersections and unions of sets
- use set-builder notation
- solve and graph conjunctions and disjunctions of statements
- solve and graph equations and inequalities involving absolute value
- solve and graph inequalities in two variables
- graph systems of linear inequalities

10. **Rational Expressions and Equations**
- simplify rational expressions
- multiply and divide rational expressions
- add and subtract rational expressions with like and unlike denominators
- solve rational equations and mixture problems
- divide polynomials
- simplify complex rational expressions
- prove theorems involving multiplication and division

11. **Radical Expressions and Equations**
- find square roots of perfect square numbers
- determine if a number is rational or irrational
- simplify radical expressions
- multiply and divide radical expressions
- rationalize denominators
- add and subtract radical expressions
- use the Pythagorean Theorem
- solve equations containing radicals

12. **Relations and Functions**
- recognize relations and functions
- determine the domain of a function
- graph linear functions
- solve problems involving linear functions
- graph quadratic functions
- solve problems using direct, inverse, joint, and combined variations

13. **Quadratic Equations**
- solve quadratic equations by factoring
- complete the square
- derive and use the quadratic formula
- determine the meaning of the discriminant
- solve rational equations
- solve radical equations
- use the quadratic formula to solve problems

**COMMENTS OR ADDITIONAL TOPICS COVERED:**

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