Algebra II – Mastery Exam Topics

- Simplifying Expressions
  - Negative and Positive Exponents
  - Rational Exponents
- Linear Functions
  - Compound Inequalities
  - Systems of Linear Equations
  - Solving and Graphing Absolute Value Equations and Inequalities
  - Piecewise Functions – graph and find equations
  - Setting up and solving linear word problems (including inequalities and linear programming)
- Rational Functions
  - Simplifying Rational Expressions
  - Complex Fractions
  - Adding, Subtracting, Multiplying and Dividing Rational Expressions
  - Solving Rational Equations
- Transformations
  - Basic graphs of parent graphs (Quadratic, Absolute Value, Cubic, Radical, Exponential, Linear, Circles, Rational, Sine, Cosine, Tangent)
  - Shifting and stretching parent graphs
  - Domain and Range
  - Composition of functions
- Quadratic Functions
  - Factoring
  - Solving Quadratic Equations with multiple methods
    - Graphing
    - Factoring
    - Completing the Square
    - Quadratic Formula
  - Graphing Quadratic Functions from Multiple Forms
    - Standard form
    - Vertex form
    - Factored form
  - Converting between standard form and vertex form by completing the square
  - Solving Systems of Nonlinear Equations
  - Writing quadratic functions from a situational word problem
- Radicals
  - Complex Numbers
  - Solving Radical Equations, including identifying extraneous solutions
  - Building and graphing equations of circles

- Exponential and Logarithmic Functions
    - Creation and graphical representation of inverse functions
    - Prove if two functions are inverses
    - Converting between logarithmic and exponential forms
    - Simplifying exponential and logarithmic expressions
    - Solving exponential and logarithmic equations
    - Power, Product, and Quotient properties of logarithms
    - Graphing logarithmic functions
    - Setting up and solving problems involving exponential growth/decay
- Trigonometry
    - Unit circle
    - Graphing and shifting of sine, cosine, and tangent functions
        - Modification of period, phase shift, vertical shift, and stretch
    - Radian measure of an angle
    - Modeling situations using shifted trig functions
    - Computation of trig values in all four quadrants with radian and degree measure
- Polynomials
    - Fundamental theorem of algebra
    - Sketching graphs of higher degree polynomial functions
    - Polynomial long division
    - Using long division and factoring to solve higher order polynomial functions