



The topics below are covered in St. Mary's Ryken Honors Algebra II curriculum.

For preparation or review, the following sites provide an array of instructional materials to help ready your child for the SMR Math Validation Test:

- <https://www.khanacademy.org/math>
- <https://www.ixl.com/math/>

Please contact the Dean of Academics, Mr. Brad Chamberlain with any questions or concerns at brad.chamberlain@smrhs.org or 301-373-4188.

2021 Algebra II Validation Test Topics

Linear Functions and Relations:

- Write linear equations from ordered pairs
- Determine if a relation is a function
- Convert between standard and slope intercept form and vice versa

Quadratic Functions and Relations:

- Graph quadratic equations and inequalities
- Solve equations by factoring, completing the square and quadratic formula
- Calculate the discriminant and determine how many and what type of solution
- Identify and graph transformations
- Convert between different forms of quadratic equations

Complex Numbers:

- Add, subtract, multiply and divide complex numbers
- Simplify and solve equations with complex numbers

Equations, Expressions and Inequalities:

- Solve multi-step equations and inequalities
- Solve and graph inequalities
- Solve absolute value equations and inequalities
- Solve and graph compound inequalities

Systems of Equations and Inequalities:

- Solve systems of equations using substitution, elimination, graphing, Cramer's Rule and Gaussian method
- Add, subtract and multiply matrices
- Calculate the determinate and inverse of a matrix
- Solve and graph nonlinear systems

Polynomials:

- Add, subtract, multiply and divide using long and synthetic division
- Calculate real and complex zeros, turning points, maximums/minimums and end behavior
- Simplify expressions using rules of exponents
- Calculate zeros using the rational zero theorem

Radical Functions:

- Add, subtract, multiply and divide functions
- Calculate inverse functions
- Graph radical functions
- n^{th} roots
- Calculate the composite of a function
- Solve equations and inequalities

Exponential and logarithmic Functions:

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- Graph exponential and logarithmic functions
- Solve equations and inequalities
- Simplify using logarithmic properties
- Use common log and natural log to simplify and solve equations and expressions

Rational Functions and Relations:

- Add, subtract, multiply and divide functions
- Graph and determine key features: asymptotes, intercepts, holes, domain and range
- Solve equations and inequalities

Conics:

- Midpoint and distance formulas
- Identify and graph circles, ellipses, and hyperbolas

Basic Trigonometry:

- Convert between radians and degrees and vice versa
- Solve using the laws of sines and cosines
- Use trig. values for special triangles 30-60-90 and 45-45-90
- Determine angles of distance using angle of elevation and depressions