**Verona High School**

**Algebra II**



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| **Unit Title / Topic: Polynomial Equations** | **Unit Duration: 2 Month** | |
| **Stage 1: Desired Results** | | |
| **Students will know:**   * How to interpret imaginary numbers * How to transform all types of polynomial functions on the coordinate plane * How to solve various polynomial equations multiple ways (graphing, factoring, formulas, processes) * How to simplify polynomial expressions through addition, subtraction, and multiplication * How to determine the number of solutions of a polynomial equation * How to transform an expression in different forms * How to divide polynomials * Key features of polynomial graphs * How to solve a real life modeling problems * How to solve systems of equations using various methods (graphing, tables, substitution, elimination) and the meaning of their answers * How to compute average rates of change | | **Students will be skilled at:**   * Performing computations with polynomials and imaginary numbers * Factoring polynomials completely * Rewriting and solve polynomials and different forms * Interpreting graphs of polynomials * Analyzing functions and switching between graphical and equation based meanings * Deciding which method of division is to be used and which is most efficient * Choosing the best way to solve problems * Analyzing functions based on average rates of change over specific intervals * Creating their own problems that represent relationships involving polynomials equations |

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| **Unit Title / Topic: Rational Equations** | **Unit Duration: 1.5 Month** |

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| **Stage 1: Desired Results** |

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| **Students will know:**   * How to perform operations on rational expressions and determine the domain * How to translate Inverse function family * How to interpret different parts of functions and how these part affect the graph * How to write rational expressions in different forms (performing operations and making common denominators) * How to graph and find all key features of graphs * How to solve rational equations | **Students will be skilled at:**   1. Solving problems involving rates with variables 2. Interpreting solutions algebraically and graphically 3. Creating and solve rational equations that represent situations 4. Understanding extraneous solutions and why they exist 5. Making comparisons between rational functions and other functions they have learned about in the past. 6. Using the graphing calculator to make graphing and analysis quicker and easier |

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| **Unit Title / Topic: Radical Expressions** | **Unit Duration: 1.5 Month** |

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| **Stage 1: Desired Results** |

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| **Students will know:**   * How to use properties of exponents with rational exponents * How to switch between root and exponent form and simplify * How to use and apply properties of radicals and exponents * How to create and use formulas involving exponents * How to solve and graph radical equations * How to analyze function operations and compositions * How to use and apply inverse functions | **Students will be skilled at:**   1. Finding the inverse of a simple (linear, quadratic, and cubic, radical functions). 2. Performing operations on radicals 3. Performing operations with functions including composition 4. Solving radical and rational exponential equations 5. Identifying an extraneous solutions 6. Solving systems graphically and algebraically 7. Finding and interpret domain and range within the context of a given problem 8. Writing a translated function given a parent function. 9. Determining the best model for a nonlinear set of data |

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| **Unit Title / Topic: Exponentials and Logarithms** | **Unit Duration: 2 Month** |

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| **Stage 1: Desired Results** |

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| **Students will know:**   * How to identify key features of exponential functions and their graphs * How to identify key features of log functions and their graphs * How to compare exponential and log functions * How to use and apply the properties of logs * The relationships between exponential and log functions * How to evaluate and use different real-life applications of exponential and log functions * How to use the calculator/spreadsheet/tables to analyze exponential and log functions | **Students will be able to:**   * Graph exponential and log functions * Evaluate exponential and log functions * Manipulate log expressions * Solve log and exponential equations * Apply compounded interest formulas * Use spreadsheet/table functions to evaluate and estimate conclusions |

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| **Unit Title / Topic: Periodic Functions and Trigonometry** | **Unit Duration: 2 Month** |

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| **Stage 1: Desired Results** |

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| **Students will know:**   * Basic trig identities * Pythagorean identities * Cofunction relationships * Basic trig functions of 30, 45 60 degree angles * The relationship between (cos, sin) and (x, y) on the unit circle * Sin, cos and tan of 30, 45, 60 * Sin, cos and tan of quadrantal angles * Period formulas * Relationship between frequency, amplitude, volume and pitch * 5 Graphical Critical Points * Inverse trig functions * Laws of Sines and Cosines | **Students will be able to:**   1. Verify basic identities 2. Simplify trig expressions 3. Solve basic right triangle trig word problems 4. Convert between radians and degrees 5. Evaluate a trigonometric function for any multiple of 30, 45, 60 or 90 6. Find all six trig functions of an angle, given one 7. Fill out a unit circle (angles in radians, coordinates of points) 8. Graph all trigonometric functions and reciprocals by hand or on calculator 9. Graph arctrig waves 10. Solve linear trig equations 11. Solve trig equations with more than one function 12. Solve trig equations graphically |