Honors Algebra 2 Syllabus

2024 – 2025 Mrs. Wharton

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Welcome to Algebra 2 at Amherst County High School!

I look forward to helping you reach your goal of having a successful year in math class.

Algebra 2 teaches advanced algebraic concepts through the study of functions, 'families of functions', equations, inequalities, non-linear systems of equations, polynomials, radicals, rational equations and expression, exponents and logarithms, asymptotes, complex numbers, interpreting statistics and normal distribution. Emphasis will be placed on the algebraic processes and their use in problem solving. Students will enhance their oral and written communication concerning the language of algebra, logic of procedure, and interpretation of results throughout the course. To meet degree requirements, some students may need to take the SOL test for this course in the Spring.

This courses is an extension of your Algebra 1 knowledge and may require you to review content from previous classes before you feel prepared for the new content. Algebra 2 can be a very demanding class for students who have weak Algebra 1 skills and will require a commitment from the student that they may not have experienced in previous classes. **As in any class, your success will rely on the effort you put into understanding the material. You will be responsible for maintaining proper notes, completing assignments, seeking appropriate help, and preparing for assessments.**

Class expectations

In this class, we will . . .

Be Responsible: Bring all materials to class each day. Turn in all assignments on time. Maintain high standards of honor with your work.

Be Respectful: Greet your classmates and teachers to promote a positive environment. Be kind and respectful of other's ideas and opinions. Clean up after yourself.

Be a Team Player: Reach out to students who have not been included. Participate fully in all classroom activities. Give your best effort in all you do.

Supplies

- One 3-ring binder (one inch or larger)
- Notebook paper (graph paper may also be helpful)
- Pencils are preferred over pen (highlighters may be helpful)
- Chromebook
- Calculator (suggested calculator to purchase is the TI-30XII-S or a TI-84 can be checked out from the library)

Grading

40% Measure of Progress (classwork and homework*)

60% Mastery of Content (Test, Quiz, Projects, Warm-Up*)

*Homework information: Students can expect to have homework multiple times in a normal schedule week. Homework is due at the beginning of the next class and will be graded on effort and completeness. Students are expected to show all work for all problems in order to earn full credit for the assignment. On time homework will be graded on a scale of 100% (fully complete) to a 70% (approximately 70% of assignment completed). Late work will be accepted one class late after the due date only if the assignment is fully completed (all work for all problems). Completed late work will receive a grade of 50%. Homework due on the day of the student absence are due immediately upon the student's return to class. Students are expected to complete their own work and any students found to be copying from another student or from a website will not receive credit for the assignment.

*Warm-Up information: Students will complete one to two review problems at the beginning of each class. These problems are to be completed without assistance from other students or from the teacher. Students may use their notes to assist in completing the warm-up. The warm-up must be turned in before the problems are discussed as a class in order to earn credit. Warm-ups will be graded for accuracy. Three weeks of individual warm-up grades will be compiled into a Mastery of Content grade. Absent students will be exempt from the warm-up grade for the absent day only.

Topics of Study (Some units may be combined depending on time needed for the unit)

Unit 1 (Algebra Review): Multistep Linear Equations, Absolute Value Equations and Inequalities

Unit 2 (Polynomial Operations): Add, Subtract, and Multiply Polynomials, Factor Polynomials, Divide Polynomials, Special Polynomial Factoring

Unit 3 (Radical Operations): Simplify Radicals, Radical Operations, Solve Radical Equations

Unit 4 (Rational Exponents and Complex Numbers): Converting Forms, Meaning of i, Complex numbers, Operations on Complex Numbers

Unit 5 (Solve Quadratic Equations and Inequalities): Solve Quadratic Equations over the Complex Number System, Model Quadratic Equations and Inequalities, Solve Quadratic Inequalities,

Unit 6 (Transformations): Parent Functions for Linear, Quadratic, Cubic, Square Root, Cube Root, Rational, Exponential, and Logarithmic Functions, Write Equations using Transformations, Graph Functions using Transformations, Find a Value of a Function given a Value from the Domain, Determine Domain, Range, Increasing and Decreasing Intervals, Extrema, and End Behavior for various functions

Unit 7(Variation): Determine Variation type, Write an Equation for Direct or Inverse Variation, Create a Graph for Direct or Inverse Variation

Unit 8 (Systems): Verify Solutions to Absolute Value and Radical Equation Graphically, Model Situations as Systems, Determine the Number of Solutions and Solve Linear-Quadratic and Quadratic-Quadratic Systems

Unit 9 (Rational Expressions and Equations): Operations and Simplify Rational Expressions, Complex Fractions, Solve Rational Equations

Unit 10 (Graphs and Solving Polynomial Equations): Piecewise Functions, Determine Domain, Range, Intercepts, Multiplicity, Intervals of Increase, Decrease, and Constant, Extrema, and End Behavior for Polynomial and Piecewise Functions, Determine the Number and Type of Solutions for Polynomial Equations, Solve Polynomials over the set of Complex Numbers

Unit 11 (Composition of Functions): Determine Function Value when give a Domain Value, Justify Inverse of a Function, Graph Inverse Functions, Composition of two Functions

Unit 12 (Exponential and Logarithmic Functions): Graphs of Exponential and Logarithmic Functions, Write Equations of Exponential and Logarithmic Functions, Determine the Domain, Range, Intercepts, Zeros, Intervals of Increase and Decrease, End Behavior, and Asymptotes of Exponential and Logarithmic Functions, Determine Function Value if given a Domain Value

Unit 13 (Regressions): Collect and Acquire Data, Represent Data as a Scatterplot, Determine Linear, Quadratic, Exponential, or Piecewise model for Data, Determine Equation of Best Fit for Data and use Correlation Coefficient to Determine Best Fit, Evaluate the Reasonableness of a Model, Make Predictions, Decisions, and Critical Judgements from Data

Unit 14 (Permutations and Combinations): Compare/Contrast Permutations and Combination to count the number of ways an even can occur, Calculate the Number of Permutations, Calculate the Number of Combinations

Unit 15 (Normal Distribution): Formulate Questions and Collect Data, Examine the shape of Data, Identify the Properties of Normal Distribution, Interpret Data Distribution, Z-Scores, Apply the Empirical Rule, Compare multiple data distributions using measure of center, measures of spread, and shape of the distribution

Unit 16 (After SOL for Honors)(Sequences and Series): Identify and Determine Rules for Arithmetic and Geometric Sequences, Sigma Notation, Sum of Series