

RSU 26 Curriculum Map

Content Area: MATH

Course: ALGEBRA 2

Grade Level: HS

Priority Standards for Course:

Continuation and expansion of all Algebra 1 Priority Standards and...

1. Graph the solutions to a linear inequality in two variables as a half-plane (excluding the boundary in the case of a strict inequality), and graph the solution set to a system of linear inequalities in two variables as the intersection of the corresponding half-plane
2. Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases
3. Graph linear and quadratic functions and show intercepts, maxima, and minima.
4. Graph exponential and logarithmic functions, showing intercepts and end behavior, and trigonometric functions, showing period, midline, and amplitude.
5. Construct linear and exponential functions, including arithmetic and geometric sequences, given a graph, a description of a relationship, or two input-output pairs (include reading these from a table).

Primary Instructional Resource: Glencoe Algebra 2

Higher Order Thinking Skills: Apply, analyze, and evaluate

Dispositions:

Make sense of problems and persevere in solving them.

Reason abstractly and quantitatively.

Model with mathematics.

Construct viable arguments and critique the reasoning of others.

Use appropriate tools strategically.

Attend to precision.

Look for and make use of structure.

Look for and express regularity in repeated reasoning.

Technology Skills:

Students use scientific calculators.

Teachers support students' organization through the use of Google.

Cultural Inclusiveness and Representation: Knowing our students each year helps to incorporate opportunities to represent cultural identities and bring diversity to our math curriculum. Through utilizing different modalities of learning and hands-on challenges presented in each unit, students will have windows and mirrors that reflect and honor the evolving diversity of our classrooms.

Unit of Instruction: Linear Equations

Essential Questions:

- How do the tools of algebra relate to equations and modeling relationships in graphic or chart form? How can you use operations on and properties of real numbers?
- How can we utilize equations to solve problems?
- How can mathematical ideas be represented?

Anticipated Time Frame: September and October

Content Concepts and Skills
I can solve and write linear equations.
I can solve and graph linear inequalities.
I can solve systems of linear equations and linear inequalities.
I can solve problems by using linear programming.

Unit of Instruction: Relations and Functions

Essential Questions:

- Why do we want to compare rather than get an exact answer?
- What are some types of relationships that can be modeled by graphs?
- What types of relationships can be modeled by linear graphs?
- What can we do with a system of equations/inequalities that we cannot do with a single equation/inequality?
- How can mathematical ideas be represented?

Anticipated Time Frame: November and December

Content Concepts and Skills
I can use equations of relations and function.
I can determine the slope of a line.
I can use scatter plots and prediction equations.
I can graph linear inequalities.

Unit of Instruction: Quadratic Functions

Essential Questions:

- Why do we use different methods to solve math problems?
- Why should we factor? How does the graph of a quadratic function relate to its algebraic equation?
- How are rational and irrational numbers the same? How are they different?

Anticipated Time Frame: January and February

Content Concepts and Skills
I can graph quadratic functions.
I can find and interpret the maximum and minimum values of a quadratic function.
I can solve quadratic functions by graphing.
I can estimate solutions of quadratic equations by graphing.
I can perform operations with pure imaginary numbers.
I can perform operations with complex numbers.
I can write quadratic equations in standard form.
I can solve quadratic equations by factoring.
I can solve quadratic equations by using the square root property.
I can solve quadratic equations by using the quadratic formula.
I can use the discriminant to determine the number and type of roots of a quadratic equation.
I can graph quadratic inequalities in two variables.
I can solve quadratic inequalities in one variable.

Unit of Instruction: Polynomials and Polynomial Functions

Essential Questions:

Why is math used to model real-world situations?

Why should we factor?

How does the graph of a quadratic function relate to its algebraic equation?

Anticipated Time Frame: March and April

Content Concepts and Skills
I can multiply, divide, and simplify monomials and expressions involving powers.
I can add, subtract, and multiply polynomials.
I can divide polynomials using long division.
I can divide polynomials using synthetic division.
I can evaluate polynomial functions.
I can identify general shapes of graphs of polynomial functions.
I can graph polynomial functions and locate their zeros.
I can find the relative maxima and minima of polynomial functions.
I can factor polynomials.
I can solve polynomial equations by factoring.
I can evaluate functions by using synthetic substitution.
I can determine whether a binomial is a factor of a polynomial by using synthetic substitution.
I can determine the number and types of roots for a polynomial equation.
I can find the zeros of a polynomial function.

Unit of Instruction: Operations with Functions

Essential Questions:

- How can you choose a model to represent a set of data?
- What are the different types of functions?
- What are the operations that apply to all functions?
- How can Geometric and Analytic representations be used to describe the behavior of the function?
- How are algebraic, numeric, and graphic representations of functions related?

Anticipated Time Frame: April and May and June, if necessary

Content Concepts and Skills
I can perform arithmetic operations with functions.
I can apply arithmetic operations with functions.
I can perform compositions of functions.
I can apply compositions of functions.
I can find the inverse of a function or relation.
I can determine whether two functions or relations are inverses.
I can graph square root functions.
I can analyze square root functions.
I can graph cube root functions.
I can analyze cube root functions.
I can solve equations containing radicals.
I can solve inequalities containing radicals.

Unit of Instruction: Graphing Exponential Functions

Essential Questions:

- How do we measure change?
- How are different representations of numbers related?
- How are different representations of functions related?
- How do we define relationships between functions?

Anticipated Time Frame: June, if time permits.

Content Concepts and Skills
I can graph exponential growth functions.
I can graph exponential decay functions.
I can solve exponential equations.
I can solve exponential inequalities.
I can use geometric sequences.
I can find sums of geometric series.