

Desoto County School District 2019-2020

Algebra II (Semester) Pacing Guide

First & Third Nine Weeks

Review (Algebra I Concepts)

- Solve, check, and graph multi-step equations and inequalities in one and two-variable with distributive property including rational coefficients in mathematical and real-world situations and interpret the solution.
- Calculate slope using graphs and formulas.
- Write equations of lines given a variety of information. (Examples: given a graph, two points, point and slope, slope and y-intercept and/or situation.)
- Solve formulas and equations for a specific variable.
- Factor polynomial expressions written in standard and non-standard forms.
- Use the Quadratic Formula to solve quadratic equations.
- Extend patterns based on arithmetic and geometric sequences, given specified initial terms and patterns of change.
- Find the value of any term in a sequence.
- Solve mathematical problems in mathematical settings involving arithmetic and geometric sequences.
- Write sequences for explicit equations.
- Write explicit expressions for arithmetic and geometric sequences.
- Compare patterns of growth in linear and exponential tables.
- Find equations for geometric sequences and see relationships between geometric sequences and exponential functions.
- Use geometric sequences to solve problems involving percent increase and decrease.
- Recognize that all sequences are functions with domains limited to positive integers.
- Identify and interpret graphs and tables of exponential functions.
- Use the parent function $y = a \cdot b^x$ to describe and predict the effects of parameter changes on graphs of exponential functions.
- Compare and contrast linear and exponential models.
- Describe the role of the parameters in context.
- Write and use models for exponential growth and decay.
- Identify the key characteristics of exponential functions including domain, range, intercepts, and shape.
- Solve exponential equations.
- Solve application problems involving exponential functions related to growth and decay.
- Solve real-world problems involving simple and compound interest and investigate the relationship between the two.
- Create multiple representations of exponential functions including a table, equation, graph, and situation and solidify their connection.
- Find equations of exponential functions by using known quantities to solve for missing parameter (for example, given two points, initial value and point).

Investigations and Functions (Chapter 1)

- Identify and graph quadratic functions.
- Model data with quadratic functions.
- Graph polynomial functions and describe end behavior.
- Fit data to linear, quadratic, cubic or quartic models.
- Identify the key features from a table or graph of linear, exponential, quadratic, square root, cube root, and piecewise-defined functions, including step functions and absolute value functions.
- Identify and describe the domain of a function to its graph.
- Explain why a domain is appropriate for a given situation.
- Compare key features of two representations of functions.

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Transformations of Parent Graphs (Chapter 2)

- Create and graph equations in two or more variables using correct labels and scales.
- Interpret complex expressions by examining their variables.
- Use factoring to find the zeros of a quadratic.
- Use completing the square to write a function in graphing form.
- Interpret key features of quadratics in a real-world context.
- Compare key features of two representations of functions.
- Recognize odd and even functions.
- Identify transformations of a function on a graph.
- Describe the effects of transformations on parent functions.
- Graph and identify the key features from a table or graph of linear, exponential, quadratic, square root, cube root, and piecewise-defined functions, including step functions and absolute value functions.
- Identify the domain, range, x-intercept(s), y-intercept, increasing intervals, decreasing intervals, the maximums, and minimums of a function by looking at the graph.

Equivalent Forms (Chapter 3)

- Add, subtract, and multiply polynomials.
- Factor polynomials using any method.
- Find common and binomial factors of quadratic expressions,
- Factor special quadratic expressions.
- Sketch graphs of polynomials using zeros.
- Use polynomial identities to prove numerical relationships.
- Identify patterns of factoring.
- Classify expressions by method of factoring.
- Solve polynomial equations by factoring and graphing.
- Find the n^{th} roots.
- Add, subtract, multiply, and divide rational expressions including those with rational and negative exponents.

* Beginning the 2016-2017 school year, we will no longer teach Appendices A & B in Algebra II. The students that are enrolled in Algebra II at this time have covered the topics covered in these appendices while taking the CCSS Algebra I course.

Note: State ACT (All Juniors): February 25, 2020

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Second & Fourth Nine Weeks

Solving and Intersections (Chapter 4)

- Determine the domain of rational and radical functions.
- Solve radical equations in one variable.
- Give examples showing how extraneous solutions may arise when solving rational and radical equations.
- Approximate or find the solutions to a system.
- Explain why the solution to a system will occur at the point(s) of intersection.
- Create and graph equations in two or more variables using correct labels and scales.
- Represent constraints of equations or inequalities in real-world situations.
- Interpret solutions of equations or inequalities in real-world situations.
- Identify and describe the domain of a function to its graph.
- Explain why a domain is appropriate for a given situations.

Inverses and Logarithms (Chapter 5)

- Define inverse function.
- Find the inverse of a relation or function.
- Recognize odd and even functions.
- Identify whether a function has an inverse and where two functions are inverses of each other.
- Evaluate and simplify natural logarithmic expressions.
- Graph exponential and logarithmic functions.
- Sketch and describe the key features of exponential and logarithmic functions.
- Explain why a domain is appropriate for a given situation.
- Compare key features of two different representations of functions.
- Use logarithms to determine the appropriateness of an exponential model.
- Identify transformations of a function on a graph.
- Describe the effects of transformations on parent functions.
- Find the composite of two functions.

More Logarithms (Chapter 6)

- Create and solve equations in two or more variables to represent relationships between quantities.
- Represent constraints by equations or inequalities, and by systems of equations and/or inequalities.
- Use properties of logarithms.
- Solve exponential and logarithmic equations using natural logarithms.
- Use logarithmic form to solve exponential models.
- Explore the properties of functions of the form $y = ab^x$.
- Solve for a specified variable in a literal equation.
- Build a function using different functions and arithmetic operations in context.

Polynomials (Chapter 8)

- Classify polynomials.
- Classify expression by method of factoring and identify patterns.
- Factor polynomials or rational expression using any method.
- Analyze and interpret the factored form of a polynomial.
- Graph polynomial functions and describe end behavior.
- Use information about polynomial functions such as zeros, turning points, and end behavior to sketch the graph of the function.
- Use the Fundamental Theorem of Algebra to solve polynomial equations with complex solutions.
- Apply transformations to graphs of polynomials.
- Define i as the square root of -1 or $i^2 = -1$ and use the relation to simplify.
- Write complex numbers in the form $a + bi$ with a and b being real numbers.
- Solve quadratic equations that have complex solutions.

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- Recognize that the commutative, associative, and distributive properties extend to the set of complex numbers over the operations of addition and multiplication.
- Give examples of polynomial identities and extend to complex numbers.
- Use the Remainder Theorem to show the relationship between a factor and a zero.
- Rewrite rational expressions using inspection or by long or synthetic division.

Trigonometric Functions (Chapter 7)

- Define and recognize the parameters of trigonometric functions.
- Interpret trigonometric functions in real-world situations.
- Identify and model periodic phenomena in real-world situations.
- Graph trigonometric functions and identify key features.
- Explain the relationship between the unit circle and the coordinate plane.

Note: Some chapters/sections were reordered. Therefore, teachers must preview homework questions to be sure no problems are assigned from an omitted chapter/section.

This pacing calendar follows the CPM Algebra II Textbook that the district has adopted as a resource to assist in teaching the MS College & Career Readiness Standards (MS CCRS) for Algebra II. The specific lessons addressed in this pacing guide are aligned to the set standards. However, this pacing guide is not meant to be an exhaustive list nor is it a list that limits how the standards are taught in the classroom. This is a sample pacing to help teachers with planning and a guide to understand the knowledge and skills that define the standards.