

Course: Algebra IIA Grade: 11 Unit Name: Equations and Inequalities

Essential Questions/ Focus Questions:

- How are addition and subtraction related and how are multiplication and division related?
- When an expression involves more than one operation, in what order do you do the operations?
- What are the steps for solving linear equations?
- What are formulas, and how are they used?
- How can problem solving strategies be used to find verbal and algebraic models?
- How are the rules for solving linear inequalities similar to those for solving linear equations, and how are they different?
- How are absolute value equations and inequalities like linear equations and inequalities?

Suggested Time Frame: approximately 20 days.

Common Core Standards Covered:

- A.CED.1 Create equations and inequalities in one variable and use them to solve problems. Include equations arising from linear and quadratic functions, and simple rational and exponential functions.
- A.CED.3 Represent constraints by equations or inequalities, and by systems of equations and/or inequalities, and interpret solutions as viable or nonviable options in a modeling context.
- A.REI.1 Explain each step in solving a simple equation; from the equality of numbers asserted at the previous step, starting from the assumption that the original equation has a solution. Construct a viable argument to justify a solution method.
- A.REI.3 Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters.
- A.REI.11 Explain why the x-coordinates of the points where the graphs of the equations $y = f(x)$ and $y = g(x)$ intersect are the solutions of the equation $f(x) = g(x)$; find the solutions approximately, e.g., using technology to graph the functions, make tables of values, or find successive approximations. Include cases where $f(x)$ and/or $g(x)$ are linear, polynomial, rational, absolute value, exponential, or logarithmic functions.
- F.IF.7 Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases.

Materials Used: (textbooks, websites, videos, etc...)

- McDougal Littell Algebra 2, Unit 1 Equations and Inequalities PowerPoint, TI Calculators(TI 83, TI 84)

Major Themes/ Concepts:

- Solving linear equations and inequalities
- Solving absolute value equations and inequalities
- Rewriting equations

Assessments:

- Pre-Test/Post-Test
- Section quizzes
- Unit Test

Course: Algebra IIA Grade: 11 Unit Name: Linear Equations and Functions

Essential Questions/ Focus Questions:

- How do you graph relations and functions
- How do you determine whether two non-vertical lines are parallel or perpendicular?
- How do you graph a linear equation?
- How do you write an equation of a line?
- What is a constant of variation and how is it related to slope?
- How can you tell if a set of data points can be modeled by a best-fitting line?
- How do the values of a , h , and k affect the graph of $y = a \cdot f(x - h) + k$ in relation to the graph of $y = f(x)$?
- What does a dashed boundary line on the graph of an inequality represent?

Suggested Time Frame: approximately 27days

Common Core Standards Covered:

- F.IF.1 Understand that a function from one set to another set assigns to each element of the domain exactly one element of the range. If f is a function and x is an element of its domain, the $f(x)$ denotes the output of f corresponding to the input x . The graph of f is the graph of the equation $y = f(x)$.
- F.IF.2 Use function notation, evaluate functions for inputs in their domains, and interpret statements that use function notation in terms of a context.
- F.IF.4 For a function that models a relationship between two quantities, interpret key features of graphs and tables in terms of the quantities, and sketch graphs showing key features given a verbal description of the relationship
- F.IF.5 Relate the domain of a function to its graph and, where applicable, to the quantitative relationship it describes
- F.IF.6 Calculate and interpret the average rate of change of a function over a specified interval. Estimate the rate of change from a graph.
- F.IF.7 Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases.
- A.REI.3 Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters.
- A.CED.2 Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.
- A.CED.3 Represent constraints by equations or inequalities, and by systems of equations and/or inequalities, and interpret solutions as viable or nonviable options in a modeling context.
- F.LE.2 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).
- F.LE.5 Interpret the parameters in a linear or exponential function in terms of a context.

Materials Used: (textbooks, websites, videos, etc...)

McDougal Littell Algebra 2, Unit 1 Equations and Inequalities PowerPoint, TI Calculators(TI 83, TI 84)
Websites on best-fitting lines and correlation

Major Themes/ Concepts:

- Graph linear equations and functions
- Graph absolute value functions
- Slope (parallel and perpendicular lines) and intercepts
- Correlation and best-fitting lines

Assessments:

- Pre-Test/Post-Test, Section quizzes, project on correlation, Unit Test

Course: Algebra IIA Grade: 11 Unit Name: Linear Systems and Matrices

Essential Questions/ Focus Questions:

- How do you solve a system of linear equations graphically?
- How do you solve a system of linear equations algebraically?
- How do you find the solution to a system of linear inequalities?
- How do you perform basic matrix operations?
- How do you find each element in the product of two matrices?
- How do you solve a system of two linear equations using inverse matrices?

Suggested Time Frame: approximately 29 days.

Common Core Standards Covered:

- A.CED.2 Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.
- A.CED.3 Represent constraints by equations or inequalities, and by systems of equations and/or inequalities, and interpret solutions as viable or nonviable options in a modeling context.
- A.REI.5 Prove that, given a system of two equations in two variables, replacing one equation by the sum of that equation and a multiple of the other produces a system with the same solutions.
- A.REI.6 Solve systems of linear equations exactly and approximately (e.g., with graphs), focusing on pairs of linear equations in two variables.
- A.REI.12 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-planes.

Materials Used: (textbooks, websites, videos, etc...)

- McDougal Littell Algebra 2, Unit 1 Equations and Inequalities PowerPoint, TI Calculators(TI 83, TI 84)

Major Themes/ Concepts:

- Solving linear equations and inequalities
- Solving absolute value equations and inequalities
- Rewriting equations

Assessments:

- Pre-Test/Post-Test
- Section quizzes
- Unit Test