**WARREN COUNTY SCHOOL DISTRICT**

PLANNED INSTRUCTION

## COURSE DESCRIPTION

**Course Title:** Honors Algebra II
**Course Number:** 00241
**Course Prerequisites:** Algebra I Honors

**Course Description:** Honors Algebra II is the second course in the honors mathematics sequence designed for those students to be able to complete calculus prior to entering college. Changes in our society and technology require a strong background in basic algebra skills. This course expands upon the intense study of algebraic theory that was started in Algebra I Honors and will continue in Honors Geometry and additional advanced math courses. This course provides further use of practical problems to apply the theory and connect algebra to the real world. Honors Algebra II is intended for college-bound students who have an aptitude or interest in mathematics. It provides them with the opportunity to complete an additional year of advanced mathematics. Recommended grade of 80% or higher earned in Algebra I Honors Grade 8 and passed the Algebra I Keystone Exam with a Proficient or Advanced score. District marking period assessments and final exam are required.

**Suggested Grade Level**: Grade 9
**Length of Course:** Two Semesters
**Units of Credit:** 1
**PDE Certification and Staffing Policies and Guidelines (CSPG) Required Teacher Certifications:**
CSPG #50 Mathematics (7-12)
To find the CSPG information, go to CSPG
**Certification verified by the WCSD Human Resources Department:** ☒Yes ☐No

## WCSD STUDENT DATA SYSTEM INFORMATION

**Course Level:** Honors & Dual Enrollment (1) GPA +5%
**Mark Types:** Check all that apply.
☒F – Final Average ☒MP – Marking Period ☒EXM – Final Exam

**GPA Type**: ☐ GPAEL-GPA Elementary ☐ GPAML-GPA for Middle Level ☒ NHS-National Honor Society
☒ UGPA-Non-Weighted Grade Point Average ☒ GPA-Weighted Grade Point Average

**State Course Code**: 02056
To find the State Course Code, go to State Course Code, download the Excel file for *SCED*, click on SCED 6.0 tab, and choose the correct code that corresponds with the course.

## TEXTBOOKS AND SUPPLEMENTAL MATERIALS

**Board Approved Textbooks, Software, and Materials:**

| | |
|---|---|
| **Title:** | *Big Ideas Math - Algebra 2: A Common Core Curriculum* |
| **Publisher:** | Big Ideas Learning, LLC. |
| **ISBN #:** | 978-1-64208-806-9 |
| **Copyright Date:** | 2019 |
| **WCSD Board Approval Date:** | 6/29/2020 |

**Supplemental Materials:** *Big Ideas Math - Algebra 1: A Common Core Curriculum* - Big Ideas Learning, LLC., Kuta Software, Get More Math, pdesas.org, TI-83 PLUS Graphing Calculator

## Curriculum Document

**WCSD Board Approval:**

| | |
|---|---|
| **Date Finalized:** | 5/23/2022 |
| **Date Approved:** | 6/13/2022 |
| **Implementation Year:** | 2022-2023 |

## SPECIAL EDUCATION, 504, and GIFTED REQUIREMENTS

The teacher shall make appropriate modifications to instruction and assessment based on a student's Individual Education Plan (IEP), Chapter 15 Section 504 Plan (504), and/or Gifted Individual Education Plan (GIEP).

## SCOPE AND SEQUENCE OF CONTENT, AND CONCEPTS

**Marking Period 1: Linear Equations, Functions, and Graphs, and Quadratic Functions: Graphs**

- Linear Equations (Review) and Literal Equations/Formulas
- Linear Graphs (Review)
- Linear Equations and Scatterplots
- Parent Functions and Transformations: Linear, Absolute Value
- Graphs of Quadratic Functions
- Transformations of Quadratic Functions
- Characteristics of Quadratic Functions
- Models of Quadratic Functions
- Marking Period 1 Review and Assessment

**Marking Period 2: Quadratic Equations, Inequalities and Complex Numbers, and Polynomial Functions**

- Quadratic Solutions: Graphs, Square Root Property, Factors
- Quadratic Functions: Factored Form
- Square Roots (Review)
- Complex Numbers
- Quadratic Equation Solution Methods: Completing the Square, Quadratic Formula
- Quadratic Inequalities
- Graphs of Polynomial Functions
- Polynomials: Addition, Subtraction, Multiplication
- Division of Polynomials
- Polynomial Factoring
- Polynomial Equations and Inequalities
- The Fundamental Theorem of Algebra
- Transformations of Polynomial Functions
- Mid-Term Review and Assessment

**Marking Period 3: Rational Exponents and Radical Functions, Exponential and Logarithmic Functions**

- nth Roots and Rational Exponents
- Properties of Rational Exponents and Radicals
- Graphs of Radical Functions
- Radical Equations and Inequalities
- Function Operations
- Inverse of a Function
- Exponential Growth and Exponential Decay Functions
- The Natural Base e
- Logarithms and Logarithmic Functions
- Exponential and Logarithmic Equations (SIMPLE)
- Marking Period 3 Review and Assessment

**Marking Period 4: Rational Functions, Sequences, and Probability**

- Rational Expressions: Multiplication, Division
- Rational Expressions: Addition, Subtraction
- Rational Equations
- Sequences
- Arithmetic Sequences
- Geometric Sequences
- Sample Spaces and Probability
- Odds
- Independent and Dependent Events
- Compound Probability
- Permutations and Combinations
- Final Exam Review and Assessment

## Standards/Eligible Content and Skills

| **Performance Indicator** | **PA Core Standard and/or Eligible Content** | **Marking Period Taught** |
|---|---|---|
| Review: Solve linear equations: Multi-Step, Variables on Both Sides, Absolute Value | A1.1.2.1.1<br>A1.1.2.1.2<br>A1.1.2.1.3 | MP1 |
| Solve a literal equation/formula for a given variable | A2.1.3.2.2 | MP1 |
| Determine how a change in one variable relates to a change in the second variable<br>(e.g., y = 4/x; if x doubles, what happens to y?) | A2.1.3.2.1 | MP1 |
| Review: Graph linear and absolute value functions:<br>Table of values, y = mx + b (Slope-Intercept) | A1.1.2.1.1<br>A1.1.2.1.3<br>A1.2.2.1.1<br>A1.2.2.1.2<br>A1.2.2.1.3<br>A1.2.2.1.4 | MP1 |
| Review: Write a linear equation from a graph | A1.2.1.2.1<br>A1.2.1.2.2 | MP1 |
| Draw, identify, find, interpret, and write an equation for a line of best fit for a scatterplot | A2.2.3.1.1 | MP1 |
| Make predictions using the equations or graphs of lines of best fit | A2.2.3.1.1 | MP1 |
| Identify a function family: Constant, Linear, Absolute Value, Quadratic | A2.2.2.2<br>A2.2.2.2.1 | MP1 |
| Graph and describe transformations of linear functions and absolute value: Translation, Reflection, Stretch, Shrink, Combination | A1.2.1.2.2<br>A2.2.2.2<br>A2.2.2.2.1 | MP1 |
| Write functions representing transformations for linear and absolute value functions | A1.2.1.2.1<br>A1.2.1.2.2 | MP1 |
| Identify characteristics of quadratic functions: Parent Function, Vertex, Axis of Symmetry, Behavior of the Graph | A2.2.1.1.4<br>A2.2.2.1.1<br>A2.2.2.2.1<br>CC.2.2.HS.C.4 | MP1 |
| Graph and use quadratic functions in the form $f(x) = ax^2$ | A2.2.2.1.1 | MP1 |
| Compare $f(x) = ax^2$ to the parent $f(x) = x^2$ | A2.2.2.2.1<br>CC.2.2.HS.C.4<br>CC.2.2.HS.C.5 | MP1 |
| Graph and use quadratic functions in the form $f(x) = ax^2 + c$ | A2.2.2.1.1 | MP1 |
| Compare $f(x) = ax^2 + c$ to the parent $f(x) = x^2$ | A2.2.2.2.1<br>CC.2.2.HS.C.4<br>CC.2.2.HS.C.5 | MP1 |
| Graph and use quadratic functions in the form $f(x)= ax^2 + bx + c$ | A2.2.2.1.1 | MP1 |

| **Performance Indicator** | **PA Core Standard and/or Eligible Content** | **Marking Period Taught** |
|---|---|---|
| Find the axis of symmetry and vertex of quadratic functions in the form $f(x)= ax^2 + bx + c$ | A2.2.1.1.4<br>A2.2.2.1.1<br>A2.2.2.2.1<br>CC.2.2.HS.C.4 | MP1 |
| Determine whether a quadratic function in the form $f(x)= ax^2 + bx + c$ has a maximum/minimum value and find the value | A2.2.2.1.3 | MP1 |
| Graph and use quadratic functions in the form $f(x) = a(x – h)^2 + k$ | A2.2.2.1.1 | MP1 |
| Compare $f(x) = a(x – h)^2 + k$ to the parent $f(x) = x^2$ | A2.2.2.2.1<br>CC.2.2.HS.C.4<br>CC.2.2.HS.C.5 | MP1 |
| Solve real-world problems involving quadratic functions | A2.2.2.1.1<br>CC.2.2.HS.C.5 | MP1 |
| Describe and graph transformations of quadratic functions: Reflections in the X- and Y-Axis, Horizontal Stretches and Shrinks, and Vertical Stretches and Shrinks | A2.2.1.1.4<br>A2.2.2.1.1<br>A2.2.2.2.1<br>CC.2.2.HS.C.4 | MP1 |
| Write a rule for a transformed quadratic function from descriptions | A2.2.2.1.1 | MP1 |
| Write and solve a function that models a real-world and mathematical problem | A2.2.2.1.1<br>CC.2.2.HS.C.5 | MP1 |
| Graph a quadratic function in standard form; find and label the vertex and axis of symmetry | A2.2.2.1.1<br>A2.2.2.1.1<br>A2.2.2.2.1<br>CC.2.2.HS.C.4 | MP1 |
| Find the minimum/maximum values of quadratic functions in real-world and mathematical problems in standard form | A2.2.1.1.4<br>A2.2.2.1.3<br>CC.2.2.HS.C.5 | MP1 |
| Describe and graph transformations of quadratic functions: Vertex, Axis of Symmetry, Minimum/Maximum, Domain/Range, Positive/Negative Intervals, Increases/Decreases | A2.2.1.1.4<br>A2.2.2.1.1<br>A2.2.2.1.3<br>A2.2.2.2.1<br>CC.2.2.HS.C.4 | MP1 |
| Graph a quadratic function in intercept form: $f(x) = a(x – p)(x – q)$ | A2.2.2.1.1 | MP1 |
| Solve real-world quadratic function modeled problems expressed in intercept form | CC.2.2.HS.C.5 | MP1 |
| Write quadratic functions: From a Table/Graph, Using a Vertex and a Point, Using a Point and X-intercepts | A2.2.2.1.1 | MP1 |
| **Marking Period 1 Review and Assessment** | | MP1 |
| • Review and extend knowledge of Linear Equations, Functions, and Graphs | | MP1 |
| • Review and extend knowledge of Quadratic Functions: Graphs | | MP1 |

| **Performance Indicator** | **PA Core Standard and/or Eligible Content** | **Marking Period Taught** |
|---|---|---|
| Solve quadratic equations by graphing | A2.1.3.1 | MP2 |
| Solve quadratic equations using the Square Root Property | A2.1.3.1.2 | MP2 |
| Factor quadratic expressions: GCF, Difference of Squares, Trinomial Squares | A2.1.2.2.1 | MP2 |
| Solve quadratic equations by factoring | A2.1.3.1.1 | MP2 |
| Find the zero(s) of a quadratic function | A2.2.1.1.4<br>A2.2.2.1.1 | MP2 |
| Solve real-world and mathematical problems using quadratic equations | A2.1.3.1<br>A2.1.3.1.1<br>A2.1.3.1.2<br>CC.2.2.HS.D.10 | MP2 |
| Review: Simplify Square Roots | A1.1.1.1.2<br>A2.1.2.1 | MP2 |
| Find square roots of negative numbers using the imaginary unit i | A2.1.1.1.1 | MP2 |
| Determine values for the equality of two complex numbers | A2.1.1.1.1 | MP2 |
| Add, subtract, and multiply complex numbers with solutions in the form a + bi | A2.1.1.2.1<br>A2.1.1.2.2 | MP2 |
| Use operations with complex numbers to model and solve real-world and mathematical problems | CC.2.1.HS.F.6 | MP2 |
| Solve quadratic equations that contain complex number solutions | A2.1.1.1.1<br>A2.1.1.1.2<br>A2.1.1.2.1<br>A2.1.2.1.1 | MP2 |
| Find the complex zeros of quadratic functions | A2.1.3.2.2<br>A2.2.1.1.4<br>A2.2.2.1.1 | MP2 |
| Solve perfect square trinomial equations using square roots | A2.1.1.1<br>A2.1.2.1.2 | MP2 |
| Solve quadratic equations by completing the square | A2.1.1.1<br>A2.1.2.1.2<br>A2.1.2.2.1 | MP2 |
| Write quadratic functions in vertex form then identify the vertex | A2.1.2.2.1<br>A2.2.1.1.4<br>A2.2.2.1.1 | MP2 |
| Solve quadratic equations using the Quadratic Formula: Two Real Solutions, One Real Solution, Imaginary Solutions | A2.1.3.1.1 | MP2 |
| Use the discriminant to determine the number and type of solutions of a quadratic equation | CC.2.2.HS.D.1 | MP2 |
| Find a possible pair of integer values of a and c and write an equation so that the quadratic equation in standard form has the given solution(s): Two Real Solutions, One Real Solution, Two Imaginary Solutions | A2.1.3.1.1 | MP2 |

| **Performance Indicator** | **PA Core Standard and/or Eligible Content** | **Marking Period Taught** |
|---|---|---|
| Solve quadratic equations using any method: Square Root Method, Factoring, Completing the Square, Quadratic Formula | A2.1.3.1<br>A2.1.3.1.1<br>A2.2.2.1.1 | MP2 |
| Solve real-world and mathematical problems using any method for quadratic equations | A2.1.3.1.1<br>A2.1.3.2.2<br>A2.2.1.1.4<br>A2.2.2.1.1<br>CC.2.2.HS.D.10 | MP2 |
| Graph quadratic inequalities in two variables | CC.2.2.HS.D.10 | MP2 |
| Solve quadratic inequalities in one variable: Graphing(coordinate plane/graphing calculator), Algebraically | CC.2.2.HS.D.10 | MP2 |
| Identify polynomial functions: Degree, Type, Leading Coefficient | A2.2.1.1.4<br>A2.2.2.1.1<br>A2.2.2.1.3<br>A2.2.2.1.4 | MP2 |
| Evaluate polynomial functions | CC.2.2.HS.D.2 | MP2 |
| Describe the end behavior of polynomial functions | A2.2.1.1.4 | MP2 |
| Graph polynomial functions using tables/graphing calculators to identify increasing and decreasing intervals | A2.2.1.1.4<br>A2.2.2.1.1<br>A2.2.2.1.3<br>A2.2.2.1.4 | MP2 |
| Sketch the graphs of polynomial functions from given characteristics | A2.2.1.1.4<br>A2.2.2.1.1<br>A2.2.2.1.3<br>A2.2.2.1.4 | MP2 |
| Add, subtract, and multiply polynomial expressions | A2.1.2.2 | MP2 |
| Write and simplify polynomial expressions from real-world and mathematical problems | A2.1.2.2<br>CC.2.2.HS.D.10 | MP2 |
| Use long division to divide polynomials | A2.1.2.2 | MP2 |
| Use synthetic division to divide polynomials by (x – a) | A2.1.2.2 | MP2 |
| Use the Remainder Theorem to evaluate polynomials with synthetic division | A2.1.2.2<br>CC.2.2.HS.D.5 | MP2 |
| Factor expressions: Grouping, Sum and Difference of Cubes, Quadratic Form | A2.1.2.2.1 | MP2 |
| Factor polynomials completely: GCF, Difference of Squares, Trinomial Squares, Grouping, Sum and Difference of Cubes | A2.1.2.2.1 | MP2 |
| Use the Factor Theorem to determine whether a binomial is a factor of a polynomial | CC.2.2.HS.D.5 | MP2 |
| Solve polynomial equations by factoring | A2.1.3.1.1 | MP2 |
| Find the real zeros of polynomial functions and sketch the graphs of the functions | A2.2.1.1.4<br>A2.2.2.1.1<br>A2.2.2.1.3<br>A2.2.2.1.4<br>CC.2.2.HS.D.5 | MP2 |

| **Performance Indicator** | **PA Core Standard and/or Eligible Content** | **Marking Period Taught** |
|---|---|---|
| Solve polynomial inequalities by graphing | A2.2.1.1.4<br>A2.2.2.1.1<br>A2.2.2.1.3<br>A2.2.2.1.4 | MP2 |
| Use the Rational Root Theorem to find all real solutions/zeros of polynomial equations/functions | A2.2.1.1.4<br>A2.2.2.1.1<br>A2.2.2.1.3<br>A2.2.2.1.4<br>CC.2.2.HS.D.5<br>CC.2.2.HS.D.10 | MP2 |
| Use given zeros to write polynomial functions of least degree that have rational coefficients and leading coefficients of 1 | CC.2.2.HS.D.5 | MP2 |
| Use the Fundamental Theorem of Algebra to determine the number of solutions/zeros for polynomial equations | A2.1.3.1.1<br>CC.2.2.HS.D.5 | MP2 |
| Use the Complex Conjugates Theorem and given zeros to write polynomial functions of least degree that have rational coefficients and leading coefficients of 1 | CC.2.2.HS.D.5 | MP2 |
| Use Descartes' Rule of Signs to determine the possible numbers of positive real zeros, negative real zeros, and imaginary zeros for polynomial functions | CC.2.2.HS.D.5 | MP2 |
| Find all the (complex) zeros of polynomial equations/functions | A2.2.1.1.4<br>A2.2.2.1.1<br>A2.2.2.1.3<br>A2.2.2.1.4<br>CC.2.2.HS.D.5 | MP2 |
| Describe and graph the transformations of represented polynomial functions | A2.2.2.2.1 | MP2 |
| Write a rule for a function that represents indicated transformations | A2.2.2.1.1<br>A2.2.2.2.1 | MP2 |
| **Mid-Term Review and Assessment** | | MP2 |
| • Review and extend knowledge of Linear Equations, Functions, and Graphs | | MP2 |
| • Review and extend knowledge of Quadratic Functions, Equations, Inequalities, and Complex Numbers | | MP2 |
| • Review and extend knowledge of Polynomial Functions | | MP2 |
| Find the nth root of numbers | A2.1.2.1.1<br>CC.2.2.HS.D.2 | MP3 |
| Evaluate expressions with rational exponents | A2.1.2.1.1<br>CC.2.2.HS.D.2 | MP3 |
| Approximate expressions with rational exponents using a calculator | A2.1.2.1.2<br>CC.2.2.HS.D.2 | MP3 |
| Solve equations using nth roots | A2.1.3.1.2 | MP3 |

| **Performance Indicator** | **PA Core Standard and/or Eligible Content** | **Marking Period Taught** |
|---|---|---|
| Use nth roots to solve real-world and mathematical problems | A2.1.2.1.1<br>CC.2.1.HS.F.1 | MP3 |
| Use properties of rational exponents to simplify expressions | A2.1.2.1.1<br>A2.1.2.1.2<br>A2.1.2.1.3<br>CC.2.2.HS.D.2 | MP3 |
| Use properties of radicals to simplify expressions:<br>Product Property, Quotient Property | A2.1.2.1<br>CC.2.2.HS.D.2 | MP3 |
| Rationalize binomial denominators using conjugates | A2.1.2.1<br>CC.2.2.HS.D.2 | MP3 |
| Add and subtract like radicals and roots | A2.1.2.1<br>CC.2.2.HS.D.2 | MP3 |
| Simplify variable radical expressions | A2.1.2.1<br>CC.2.2.HS.D.2 | |
| Graph radical functions | A2.2.2.1.4 | MP3 |
| Identify the characteristics of radical functions:<br>Domain, Range, Increasing/Decreasing | A2.2.2.2.1<br>A2.2.1.1.4 | MP3 |
| Describe and graph the transformation of radical functions:<br>Horizontal Translation, Vertical Translation, Reflection,<br>Horizontal Stretch/Shrink, Vertical Stretch/Shrink | A2.2.2.2.1 | MP3 |
| Write transformed radical functions from descriptions | CC.2.2.HS.D.7 | MP3 |
| Identify extraneous solutions in radical equations | A2.1.3.1.2 | MP3 |
| Solve an equation with one radical; check the solutions | A2.1.3.1.2 | MP3 |
| Solve an equation with two radicals; check the solutions | A2.1.3.1.2 | MP3 |
| Solve an equation with a rational exponent; check the solutions | A2.1.3.1.2 | MP3 |
| Solve real-world and mathematical problems using radical equations | A2.1.3.1.2 | MP3 |
| Solve radical inequalities | A2.1.3.1.2<br>CC.2.2.HS.D.10 | MP3 |
| Add, subtract, multiply, and divide functions | CC.2.2.HS.D.2 | MP3 |
| Evaluate functions | CC.2.2.HS.D.2 | MP3 |
| Compose functions | CC.2.2.HS.D.2 | MP3 |
| Write a rule for a composite function | CC.2.2.HS.D.2 | MP3 |
| Find the inverse of a function: Linear, Non-linear | A2.2.1.1.3 | MP3 |
| Determine if two functions are inverses by comparing their tables of values/graphing calculator | A2.2.1.1.3 | MP3 |
| Determine whether an exponential function represents exponential growth or exponential decay | A2.2.1.1.4 | MP3 |
| Graph exponential growth and exponential decay functions | A2.2.2.1.2 | MP3 |
| Apply exponential growth and exponential decay formulas in real-world and mathematical problems:<br>General Exponential Model, Compound Interest | A2.1.3.1.4 | MP3 |

| **Performance Indicator** | **PA Core Standard and/or Eligible Content** | **Marking Period Taught** |
|---|---|---|
| Simplify natural base e expressions | A2.1.2.1.4 | MP3 |
| Determine whether a natural base e function represents exponential growth or exponential decay; graph the function | A2.2.1.1.4 | MP3 |
| Apply exponential growth and exponential decay formulas in real-world and mathematical problems: Continuously Compounded Interest | A2.1.3.1.4 | MP3 |
| Convert between exponential and logarithmic forms | A2.1.2.1.4<br>A2.2.2.1.4 | MP3 |
| Evaluate common and natural logarithmic expressions | A2.1.2.1.4 | MP3 |
| Solve SIMPLE logarithmic equations: Common, Natural | A2.1.3.1.3<br>A2.2.2.1.2 | MP3 |
| **Marking Period 3 Review and Assessment** | | MP3 |
| • Review and extend knowledge of Rational Exponents and Radical Functions | | MP3 |
| • Review and extend knowledge of Exponential and Logarithmic Functions | | MP3 |
| Simplify rational expressions | A2.1.2.2.2 | MP4 |
| Multiply and divide rational expressions | A2.1.2.2.2 | MP4 |
| Model and simplify rational expressions of real-world and mathematical problems with multiplication and division | A2.1.2.2.2<br>CC.2.2.HS.D.10 | MP4 |
| Find a Least Common Multiple (LCM) of rational expressions | A2.1.2.2.2 | MP4 |
| Add and subtract rational expressions with like and unlike denominators | A2.1.2.2.2 | MP4 |
| Model and simplify rational expressions of real-world and mathematical problems with addition and subtraction | A2.1.2.2.2<br>CC.2.2.HS.D.10 | MP4 |
| Simplify complex fractions | A2.1.3.1.2 | MP4 |
| Solve rational equations: Cross Multiplying, Using the Least Common Denominator (LCD) | A2.1.3.1.2 | MP4 |
| Solve rational equations with extraneous solution(s) | A2.1.3.1.2 | MP4 |
| Model and solve real-world and mathematical problems using rational equations: Mixture, Work-rate | A2.1.3.1.2<br>CC.2.2.HS.D.10 | MP4 |
| Write terms in sequence notation from a given function | A2.2.1.1.1<br>A2.2.1.1.2<br>CC.2.2.HS.C.3 | MP4 |
| Identify and describe patterns in a sequence | A2.2.1.1.1<br>A2.2.1.1.2 | MP4 |
| Graph a sequence | A2.2.1.1.1<br>A2.2.1.1.2 | MP4 |
| Write a rule for the nth term of a sequence | A2.2.1.1.1<br>A2.2.1.1.2<br>CC.2.2.HS.C.3 | MP4 |

| **Performance Indicator** | **PA Core Standard and/or Eligible Content** | **Marking Period Taught** |
|---|---|---|
| Identify and describe an arithmetic sequence | A2.2.1.1.1<br>A2.2.1.1.2 | MP4 |
| Write and use a rule for the nth term of an arithmetic sequence given a sequence | A2.2.1.1.1<br>A2.2.1.1.2<br>CC.2.2.HS.C.3 | MP4 |
| Write and graph a rule for the nth term of an arithmetic sequence given a term and the common difference | A2.2.1.1.1<br>A2.2.1.1.2<br>CC.2.2.HS.C.3 | MP4 |
| Write a rule for the nth term of an arithmetic sequence given two terms from a list, graph, and table of values | A2.2.1.1.1<br>A2.2.1.1.2<br>CC.2.2.HS.C.3 | MP4 |
| Identify and describe a geometric sequence | A2.2.1.1.1<br>A2.2.1.1.2 | MP4 |
| Write and use a rule for the nth term of a geometric sequence given a sequence | A2.2.1.1.1<br>A2.2.1.1.2<br>CC.2.2.HS.C.3 | MP4 |
| Write and graph a rule for the nth term of a geometric sequence given a term and the common ratio | A2.2.1.1.1<br>A2.2.1.1.2<br>CC.2.2.HS.C.3 | MP4 |
| Write a rule for the nth term of a geometric sequence given two terms from a list, graph, and table of values | A2.2.1.1.1<br>A2.2.1.1.2<br>CC.2.2.HS.C.3 | MP4 |
| Find the indicated number of terms of a sequence given the first term and a rule | A2.2.1.1.1<br>A2.2.1.1.2 | MP4 |
| Review: Sample Spaces | A2.2.3.2 | MP4 |
| Review: Find theoretical and experimental probabilities | A2.2.3.2 | MP4 |
| Identify and determine the odds in favor and/or against occurring | A2.2.3.2.2 | MP4 |
| Use odds to find probability and use probability to find odds | A2.2.3.2.2 | MP4 |
| Determine whether events are independent events | A2.2.3.2.3<br>CC.2.4.HS.B.6 | MP4 |
| Find probabilities of independent and dependent events | A2.2.3.2.3<br>CC.2.4.HS.B.6 | MP4 |
| Find conditional probabilities | A2.2.3.2.3<br>CC.2.4.HS.B.6 | MP4 |
| Use probability for independent and dependent events to predict outcomes | A2.2.3.2.3<br>CC.2.4.HS.B.6 | MP4 |
| Use the concepts of independence and conditional probability to interpret data | A2.2.3.2<br>CC.2.4.HS.B.6 | MP4 |
| Find the probabilities of compound events:<br>Disjoint Events(Mutually Exclusive), Overlapping Events | A2.2.3.2<br>CC.2.4.HS.B.7 | MP4 |
| Apply the rules of probability to compute probabilities of compound events in a uniform probability model | A2.2.3.2<br>CC.2.4.HS.B.7 | MP4 |
| Use probability for compound events to predict outcomes | A2.2.3.2.3<br>CC.2.4.HS.B.7 | MP4 |

| **Performance Indicator** | **PA Core Standard and/or Eligible Content** | **Marking Period Taught** |
|---|---|---|
| Use the Fundamental Counting Principal to determine the number of outcomes | A2.2.3.2.1 | MP4 |
| Find the number of permutations | A2.2.3.2.1 | MP4 |
| Find the number of combinations | A2.2.3.2.1 | MP4 |
| Use permutations and combinations to find probabilities of real-world and mathematical problems | A2.2.3.2.1 | MP4 |
| **Final Exam Review and Assessment** | | MP4 |
| • Review and extend knowledge of Rational Exponents and Radical Functions | | MP4 |
| • Review and extend knowledge of Exponential and Logarithmic Functions | | MP4 |
| • Review and extend knowledge of Rational Functions | | MP4 |
| • Review and extend knowledge of Sequences | | MP4 |
| • Review and extend knowledge of Probability | | MP4 |

## ASSESSMENTS

**PDE Academic Standards, Assessment Anchors, and Eligible Content:** The teacher must be knowledgeable of the PDE Academic Standards, Assessment Anchors, and Eligible Content and incorporate them regularly into planned instruction.

**Formative Assessments:** The teacher will utilize a variety of assessment methods to conduct in-process evaluations of student learning.

**Effective formative assessments for this course include:**
**Suggested but not limited to:**

- Pre-assessments of prior knowledge (e.g., Entrance cards or KWL chart)
- Bellringers/Problems of the Day (PODs)
- Discussions
- Exit ticket
- Teacher observations/Questioning
- Graphic organizers (e.g., Venn Diagrams, word mapping, webbing, KWL chart, etc.)
- Outlining
- Cooperative learning
- Written work
- Quizzes
- Oral response
- Self-evaluation
- Homework
- Summarizing
- Note-taking

**Summative Assessments:** The teacher will utilize a variety of assessment methods to evaluate student learning at the end of an instructional task, lesson, and/or unit.

**Effective summative assessments for this course include:**
**Suggested but not limited to:**

- Performance assessment
- Chapter/unit tests
- Quizzes
- Marking period assessments
- Mid-term exam
- Final exam
- Projects
- Student presentations