

Course Description

This course is intended to strengthen Algebra I skills and to develop the basic concepts of Algebra II. The course includes solving equations and inequalities in one or more variables, solving systems in two variables, linear and quadratic functions and their graphs, products and factors of polynomials, rational expressions, fractional exponents, radicals, logarithms, probability, and complex numbers.

Scope and Sequence

Timeframe	Unit	Instructional Topics
8 Day(s)	Expressions, Equations, Inequalities, and Linear Functions (1.3 - 1.6)	1. Simplifying and Evaluating Algebraic Expressions (Section 1.3) 2. Solving Algebraic Equations (Section 1.4) 3. Solving Inequalities (Section 1.5) 4. Absolute Value Equations and Inequalities (Section 1.6)
26 Day(s)	Functions, Graphs, and Systems of Equations and Probability (2.1-3.5*)	1. Relations and Functions (Section 2.1) 2. Linear Functions and Slope-Intercept Form (Section 2.2/2.3) 3. Additional Forms of Linear Equations (Section 2.4) 4. Using Linear Models (Section 2.5) 5. Absolute Value Functions and Graphs (Section 2.7) 6. Two-Variable Inequalities (Section 2.8) 7. Solving Systems Using Tables and Graphs (Section 3.1) 8. Solving Systems Algebraically (Section 3.2) 9. Systems of Inequalities (Section 3.3) 10. Linear Programming (Section 3.4) 11. **Systems with Three Variables (Section 3.5)
21 Day(s)	Quadratic Functions and Equations (4.1 - 4.9)	1. Quadratic Functions and Transformations (Section 4.1) 2. Standard Form of a Quadratic Function (Section 4.2) 3. **Modeling with Quadratic Functions (Section 4.3) 4. Factoring Quadratic Expressions (Section 4.4) 5. Quadratic Equations (Section 4.5) 6. Completing the Square (Section 4.6) 7. The Quadratic Formula (Section 4.7) 8. Complex Numbers (Section 4.8) 9. Quadratic Systems (Section 4.9)
19 Day(s)	Polynomial and Radical Functions (5.1 - 5.9)	1. Polynomial Functions (Section 5.1) 2. Polynomials, Linear Factors, and Zeros (Section 5.2) 3. Solving Polynomial Equations (Section 5.3) 4. Dividing Polynomials (section 5.4) 5. Theorems about Roots of Polynomial Equations (Section 5.5) 6. The Fundamental Theorem of Algebra (Section 5.6) 7. Transforming Polynomial Functions (Section 5.9)
20 Day(s)	Rational Exponents (6.1 - 6.8)	1. Roots and Radical Expressions (Section 6.1) 2. Multiplying and Dividing Radical Expressions (Section 6.2) 3. Adding and Subtracting Radical Expressions (Section 6.3) 4. Rational Functions (Section 6.4) 5. Solving Square Root and Other Radical Equations (Section 6.5) 6. Function Operations (Section 6.6) 7. Inverse Relations and Functions (Section 6.7) 8. Graphing Rational Functions (Section 6.8)

Algebra II/ Advanced Algebra II (2016)

Wright City R-II
Mathematics
Grades 10 - 12, Duration 1 Year, 1 Credit
Required Course

17 Day(s)	Exponential and Logarithmic Functions (7.1 - 7.6)	<ol style="list-style-type: none">1. Exploring Exponential Models (Section 7.1)2. Properties of Exponential Functions (Section 7.2)3. Logarithmic Functions as Inverses (Section 7.3)4. Properties of Logarithms (Section 7.4)5. Exponential and Logarithmic Equations (Section 7.5)6. Natural Logarithms (Section 7.6)
13 Day(s)	Logarithmic and Rational Functions (8.3 - 8.6)	<ol style="list-style-type: none">1. Rational Functions and Their Graph (Section 8.3)2. Rational Expressions (Section 8.4)3. Adding and Subtracting Rational Expressions (Section 8.5)4. Solving Rational Equations (Section 8.6)
15 Day(s)	Probability and Data Analysis (11.3 - 11.10)	<ol style="list-style-type: none">1. Probability (Section 11.2/3)2. Probability Models (Section 11.5)3. Basic Analyzing Data (Section 11.6)4. Standard Deviation (Section 11.7)5. Samples and Surveys (Section 11.8)6. Normal Distributions

Prerequisites

Algebra 1 AND Geometry

** A student may take Geometry and Algebra 2 (neither advanced) their sophomore year, if they excel in Algebra 1 their freshmen year, and intend to take AP Calculus their senior year. The student must have their current teacher's recommendation, as well as, parent and principal approval.

Course Instructional Resources/Textbook

Algebra 2 Common Core Teacher's Edition PEARSON 2015
ISBN 13: 978-0-13-328124-8

Algebra 2 Common Core Student Edition PEARSON 2015
ISBN 13: 978-0-13-328116-3

Course Details

UNIT: Expressions, Equations, Inequalities, and Linear Functions (1.3 - 1.6) -- 8 Day(s)

Unit Description

This unit covers all of Chapter 1 (1.1 - 1.6)

We have omitted Sections 1.1, 1.2, as those topics are review material and can be reviewed within Sections 1.3 and 1.4.

This unit starts with review Algebraic Expressions. The students then review solving equations and inequalities, including Absolute Value equations/inequalities.

Enduring Understandings/Essential Learner Outcomes

Students will be able to manipulate algebraic expressions.

Students will be able to solve algebraic equations and inequalities.

Academic Vocabulary

Algebraic Expression
Evaluate
Simplify
Term
Coefficient
Constant
Constant Term

Like Terms
Variable
Equation
Solution of an Equation
Inverse Operations
Identity
Literal Equation
Compound Inequality
Absolute Value
Extraneous Solution

TOPIC: Simplifying and Evaluating Algebraic Expressions (Section 1.3) -- 2 Day(s)

Description

Covered in Section 1.3

Students will review how real world phrases can be written as mathematical expressions. They will also work on evaluating algebraic expressions for specific values and simplifying algebraic expressions by combining like terms.

Academic Vocabulary (What terms will students need to know?)

Algebraic Expression
Evaluate
Simplify
Term
Coefficient
Constant
Constant Term
Variable
Like Terms

Learning Targets

Students will be able to evaluate a mathematical expression.

MA.A2.NQ.A.2

Students will be able to write a mathematical expression from a phrase.

MA.A2.NQ.A.2

Students will be able to simplify a mathematical expression.

MA.A2.NQ.A.2

TOPIC: Solving Algebraic Equations (Section 1.4) -- 2 Day(s)

Description

Covered in Section 1.4

Students will learn that equations are made up from two or more Algebraic expressions that are equivalent. Students will also review the Properties of Equality.

Academic Vocabulary (What terms will students need to know?)

Equation
Solution of an Equation
Inverse Operations
Identity
Literal Equation

Learning Targets

Students will be able to create equations to model a situation.

MA.A2.REI.A.1

Students will be able to solve equations.

MA.A2.REI.A.1

TOPIC: Solving Inequalities (Section 1.5) -- 2 Day(s)**Description**

Students will solve and graph inequalities. Students will also learn what compound inequalities are, and how to write and solve them.

Academic Vocabulary (What terms will students need to know?)

Inequality

Compound Inequality

Learning Targets

Students will be able to create inequalities to model a situation.

MA.A2.REI.A.1

Students will be able to create compound inequalities to model a situation.

MA.A2.REI.A.1

Students will be able to graph inequalities on a numberline.

MA.A2.REI.A.1

Students will be able to solve compound inequalities.

MA.A2.REI.A.1

Students will be able to solve inequalities.

MA.A2.REI.A.1

Students will be able to graph compound inequalities on a numberline.

MA.A2.REI.A.1

TOPIC: Absolute Value Equations and Inequalities (Section 1.6) -- 2 Day(s)**Description**

Students will write and solve equations and inequalities involving absolute value.

Academic Vocabulary (What terms will students need to know?)

Absolute Value

Extraneous Solution

Learning Targets

Students will be create absolute value equations/inequalities to model a situation.

MA.A2.REI.A.1

Students will be able to solve absolute value equations/inequalities.

MA.A2.REI.A.1

Students will be able to find extraneous solutions when solving absolute value equations.

MA.A2.REI.A.1

UNIT: Functions, Graphs, and Systems of Equations and Probability (2.1-3.5*) -- 26 Day(s)**Unit Description**

This unit covers all of Chapter 2 (2.1 - 2.8) and all of Chapter 3 (3.1 - 3.5*)

We have omitted Section 2.2, We covered direct variation (from 2.2) concurrently with topics from section 2.3 during the 2016-2017 School Year

*3.5 will only be covered by Advanced Algebra II students.

We have omitted Sections 2.6 (covered transformations in 2.7), 3.6 (no need to cover matrices) during the 2016-2017 School Year

In this unit, students study the three forms of a linear equations (slope-Intercept, standard, and point-slope) and linear models. Students will then begin to learn about all of the transformations various functions can have. Students will also be able to see the over all functions and find specific values by graphing. Finally students will learn how equations and inequalities can intersect both

graphically and algebraically.

Enduring Understandings/Essential Learner Outcomes

Students will understand what the graph of a linear function looks like.

Students will understand that linear functions have a maximum/minimum value.

Students will understand what types of real world problems/applications use linear functions/equations.

Students will understand that most often Inequalities have an infinite number of solutions.

Students will understand that a solution to a System of Equations/Inequality is where all of the functions/graph intersect.

Academic Vocabulary

Slope

Linear Function

Linear Equation

Y-intercept

X-intercept

Slope-Intercept Form

Direct Variation

Point-Slope Form

Standard form of a Linear Equation

Parallel Lines

Perpendicular Lines

Scatter Plot

Correlation

Line of Best Fit

Correlation Coefficient

Section 2.6 (covered with Section 2.7)

Parent Function

Transformation

Translation

Reflection

Vertical Stretch

Vertical Compression

Section 2.7

Absolute Value Function

Axis of Symmetry

Vertex

Section 2.8

Linear Inequality

Boundary

Half-plane

Test Point

CHAPTER 3

Section 3.1

System of Equations

Linear System

Solution of a System

Inconsistent System

Consistent System

Independent System

Dependent System

Section 3.2
Equivalent Systems
Substitution Method
Elimination Method

Section 3.3
Linear System of Inequalities

Section 3.4
Constraint
Linear Programming
Feasible Region
Objective Function

Section 3.5
All vocabulary already covered.

TOPIC: Relations and Functions (Section 2.1) -- 2 Day(s)

Description

In this section students will be introduced to concepts that they will use for the remainder of the year. Specifically, students will learn what constraints make a function. How to find the domain and range of a function. As well as, learning how to write and use function notation.

Academic Vocabulary (What terms will students need to know?)

Relation
Domain
Range
Function
Vertical-Line Test
Function Rule
Function Notation
Independent Variable
Dependent Variable

Learning Targets

Students will be able to identify the domain and range of a function.

MA.A2.IF.A.1

Students will be able to determine if a relation is a function

MA.A2.IF.A.1

Students will be able to determine the independent (x) value and the dependent (y) value of a situation.

MA.A2.IF.A.1

Students will be able to model a situation using a function rule and function notation.

MA.A2.IF.A.1

Students will be able to use the Vertical-Line Test to determine if a relation/graph is a function.

MA.A2.IF.A.1

TOPIC: Linear Functions and Slope-Intercept Form (Section 2.2/2.3) -- 2 Day(s)**Description**

Students will graph linear equations. Students will also write equations of lines using slope-intercept form. Direct Variation (from section 2.2) will also be covered during this section and will be explained as a special set of lines when the y-intercept is zero.

Academic Vocabulary (What terms will students need to know?)

Direct Variation (from 2.2)

Slope

Linear Function

Linear Equation

Y-intercept

X-intercept

Slope-Intercept Form

Learning Targets

Students will be able to solve for the constant of variation (k) in direct variation equations ($y = kx$).

MA.A2.REI.A.1

Students will be able to interpret if a function is direct variation from a table (all values relations y/x will equal the same k).

MA.A2.IF.A.1

Students will be able to write a linear equation in Slope-Intercept Form ($y=mx+b$).

MA.A2.IF.A.2

Students will be able to graph a linear equation in Slope-Intercept Form ($y=mx+b$) by knowing the slope (m) and the y-intercept (b).

MA.A2.IF.A.1

Students will be identify if a given line has a positive, negative, zero (horizontal), or undefined (vertical) slope.

MA.A2.IF.A.1

Students will be able to recognize the relationship between a linear equation in Slope-Intercept form and a Direct Variation Equation.

A Direct Variation equation is a special case of a Slope-Intercept equation when the y-intercept is 0, the constant of variation (k) is the same as slope (m).

MA.A2.BF.A.1

Students will be able to find the slope of a line between two points [$m = (y_2 - y_1) / (x_2 - x_1)$].

MA.A2.IF.A.2

Students will be able to graph a linear equation with zero slope ($y=b$) and undefined slope ($x=\#$).

MA.A2.IF.A.1

Students will be able to identify the x-intercept and y-intercept of a given line.

MA.A2.IF.A.1

Students will be able to use the direct variation equation ($y = kx$) with a given constant of variation (k) to solve for an unknown value (x or y).

MA.A2.REI.A.1

Students will be able to interpret if a function is direct variation from a graph (the line is going through the point (0,0) having a y-intercept of 0)

MA.A2.IF.A.1

TOPIC: Additional Forms of Linear Equations (Section 2.4) -- 2 Day(s)**Description**

Students will learn to write the equation of a line in standard form and point-slope form. Students will also learn how slope is related between parallel and perpendicular lines.

Academic Vocabulary (What terms will students need to know?)

Point-Slope Form

Standard form of a Linear Equation

Parallel Lines

Perpendicular Lines

Learning Targets

Students will be able to write a linear equation in Point-Slope Form [$y - y_1 = m(x - x_1)$] given two points or a point and the slope.

MA.A2.IF.A.1

Students will be able to write a linear equation in Standard Form ($Ax + By = C$ where A and B are integers and do not =0).

MA.A2.IF.A.1

Students will be able to convert between all three forms of a linear equation (Standard, Slope-Intercept, and Point-Slope).

MA.A2.IF.A.2

Students will be able to graph a linear equation in Point-Slope Form [$y - y_1 = m(x - x_1)$] by knowing the slope (m) and a point (y_1, x_1).

MA.A2.IF.A.1

Students will be able to graph a linear equation in Standard Form ($Ax + By = C$) by knowing the y-intercept and the x-intercept.

MA.A2.IF.A.1

Students will be able to graph a parallel line (same slope, different y-intercept) to a given line.

MA.A2.IF.A.1

Students will be able to graph a perpendicular line (slope is opposite reciprocal) to a given line.

MA.A2.IF.A.1

TOPIC: Using Linear Models (Section 2.5) -- 2 Day(s)**Description**

Students will learn to write linear equations that model real-world data. They will also be able to find a trend line for the data, as well as, line that 'best fits' the data of a scatter plot. With these skills they will also learn to make predictions from linear models.

Finding the line of best fit will be achieved by using Desmos.

Academic Vocabulary (What terms will students need to know?)

Scatter Plot

Correlation

Line of Best Fit

Correlation Coefficient

Learning Targets

Students will be able to draw a trend line through a plotted set of data.

MA.A2.BF.A.1

Students will be able to find the equation of a given trend line.

MA.A2.BF.A.1

Students will be able to inspect a set of data and describe its correlation (positive/negative, strong/weak, no correlation).

MA.A2.DS.A.7

Students will be able to make predictions from a set of data using a trend- line or line of best fit.

MA.A2.DS.A.7

TOPIC: Absolute Value Functions and Graphs (Section 2.7) -- 4 Day(s)**Description**

Students will focus on how to graph two variable absolute value functions. Within this section, they will also begin to learn about transformations/translations and families of functions. The topic of transformations/translations is covered throughout the rest of the year which is why we do not devote an entire section to it this early in the school year.

Academic Vocabulary (What terms will students need to know?)From 2.6:

Parent Function
Transformation
Translation
Reflection
Vertical Stretch
Vertical Compression

From 2.7:

Absolute Value Function
Axis of Symmetry
Vertex

Learning Targets

Students will be able to describe the transformations of an Absolute Value Equation using the general form ($y = a | x - h | + k$)

Vertical Stretch when $a > 1$
Vertical Compression when $0 < a < 1$
Reflection over the x-axis when $-a$

Horizontal Shift Left when $h < 0$
Horizontal Shift Right when $h > 0$

Vertical Shift Up when $k > 0$
Vertical Shift Down when $k < 0$

MA.A2.BF.A.3

Students will be able to graph absolute value equations.

General Form: $y = a | x - h | + k$

Graphs will look like a "V"

Vertex (h, k)

Axis of symmetry at $x = h$

MA.A2.IF.A.1

TOPIC: Two-Variable Inequalities (Section 2.8) -- 2 Day(s)

Description

Students will learn about linear inequalities. They will also learn why graphs are a better representation of the solution sets than a specific range of numbers.

Academic Vocabulary (What terms will students need to know?)

Linear Inequality

Boundary

Half-plane

Test Point

Learning Targets

Students will be able to graph 2-variable linear inequalities.

MA.A2.IF.A.1

Students will be able to solve linear systems of equations using the elimination method.

MA.A2.IF.A.1

TOPIC: Solving Systems Using Tables and Graphs (Section 3.1) -- 1 Day(s)

Description

Students will focus on systems of linear equations in this section. Specifically, students will solve linear systems using graphs or tables. They will understand that if two tables have the same point or two lines intersect that point is a solution to both equations, and the solution to the system.

Academic Vocabulary (What terms will students need to know?)

System of Equations

Linear System

Solution of a System

Inconsistent System

Consistent System

Independent System

Dependent System

Learning Targets

Students will be able to solve a linear system of equations using a table and/or graph.

MA.A2.REI.B.3

Students will be able to classify a system as Consistent, Inconsistent, Independent, and/or Dependent.

MA.A2.REI.B.3

TOPIC: Solving Systems Algebraically (Section 3.2) -- 4 Day(s)

Description

Students will focus on systems of linear equations in this section. Specifically, students will solve linear systems algebraically. They will learn two methods: Substitution and Elimination. They will be able to use either method to solve the system algebraically. Students will also know when to use Substitution instead of Elimination and vice versa based off of the specific system they are trying to solve.

Academic Vocabulary (What terms will students need to know?)

Equivalent Systems
Substitution Method
Elimination Method

Learning Targets

Students will be able to solve linear systems of equations using the substitution method.

MA.A2.REI.B.3

Students will be able to solve linear systems of equations using the elimination method.

MA.A2.REI.B.3

TOPIC: Systems of Inequalities (Section 3.3) -- 3 Day(s)

Description

Students will focus on systems of linear inequalities in this section. Specifically, students will solve linear systems graphically. They will understand that the multi-shaded region is where the solutions to the system of inequalities exist.

Academic Vocabulary (What terms will students need to know?)

Linear System of Inequalities

Learning Targets

Students will be able to find the solution to a linear system of inequalities by locating the multi-shaded region while graphing.

MA.A2.REI.B.3

TOPIC: Linear Programming (Section 3.4) -- 2 Day(s)

Description

Students will focus on linear programming in this section. This section will take the skills acquired in section 3.3 (linear inequalities) and apply them to a situation where there are many constraints on the problem.

Academic Vocabulary (What terms will students need to know?)

Constraint
Linear Programming
Feasible Region
Objective Function

Learning Targets

Students will be able to use linear programming to find the maximum or minimum value of a feasible region of solutions.

MA.A2.REI.B.3

TOPIC: **Systems with Three Variables (Section 3.5) -- 2 Day(s)**Description**

Students will focus on systems of 3 linear equations in this section. Specifically, students will be able to solve linear systems algebraically that contain more than 2 equations.

Academic Vocabulary (What terms will students need to know?)

All vocabulary already covered.

Learning Targets

Students will be able to solve linear systems of equations using the substitution method.

MA.A2.REI.B.3

Students will be able to solve linear systems of equations using the elimination method.

MA.A2.REI.B.3

UNIT: Quadratic Functions and Equations (4.1 - 4.9) -- 21 Day(s)**Unit Description**

This unit covers all of Chapter 4 (4.1 - 4.9)

*4.3 will only be covered by Advanced Algebra II students. As this is a direct application of Section 3.5 which we did not cover in Algebra 2 during the 2016-2017 school year.

In this unit, students will continue to learn about all of the transformations various functions by studying specifically the vertex and standard forms of Quadratic equations. Students will also begin to find the zeros of polynomial equations by first studying quadratic equations and finding their zeros. Students will find zeros of quadratics by factoring, completing the square, and the quadratic formula. Finally, students will be introduced to complex numbers and work with some systems of equations that contain quadratic equations.

Enduring Understandings/Essential Learner Outcomes

Students will understand what the graph of a quadratic function looks like.

Students will understand that quadratic functions have a maximum/minimum value.

Students will understand what types of real world problems/applications use quadratic functions/equations.

Academic VocabularySection 4.1

Parabola

Quadratic Function

Vertex Form

Axis of Symmetry

Vertex of the Parabola

Minimum Value

Maximum Value

Section 4.2

Standard Form of a Quadratic Equation

Section 4.3

Quadratic Regression

Section 4.4

Factoring

Greatest Common Factor (GCF) of an expression

Perfect Square Trinomial

Difference of Two Squares

Section 4.5

Zero of a Function
Zero-Product Property

Section 4.6

Completing the Square

Section 4.7

Quadratic Formula
Discriminant

Section 4.8

Imaginary Unit " i "
Imaginary Number
Complex Number
Pure Imaginary Number
Complex Number Plane
Absolute Value of a Complex Number
Complex Conjugates

Section 4.9 - NONE

N/A

TOPIC: Quadratic Functions and Transformations (Section 4.1) -- 2 Day(s)

Description

Students will focus on how to graph quadratic equations specifically in vertex form. This will extend their thinking about how families of functions translate/transform. Students will also be able to determine the vertex and other characteristics of quadratic equations (Axis of Symmetry, Minimum/Maximum Value, etc.) from their graph, as well as, from their equation.

Academic Vocabulary (What terms will students need to know?)

Parabola
Quadratic Function
Vertex Form
Axis of Symmetry
Vertex of the Parabola
Minimum Value
Maximum Value

Learning Targets

Students will be able to graph a quadratic function in Vertex Form.

MA.A2.IF.A.1

Students will be able to describe the transformations of an Quadratic Equation in Vertex Form ($y = a(x - h)^2 + k$)

MA.A2.BF.A.3

Students will be able to find the vertex of a Quadratic function in Vertex Form.

MA.A2.IF.A.1

TOPIC: Standard Form of a Quadratic Function (Section 4.2) -- 2 Day(s)**Description**

Students will focus on how to graph quadratic equations specifically in standard form. In order to do this, students will learn how to find the x-value of the vertex by using the equation $x = -b/2a$. Students will then be able to determine the vertex and other characteristics of quadratic equations (Axis of Symmetry, Minimum/Maximum Value, etc.) in standard form, as well as, convert standard form equations to vertex form.

Academic Vocabulary (What terms will students need to know?)

Standard Form of a Quadratic Equation

Learning Targets

Students will be able to recognize the similarities and differences between standard and vertex forms of a Quadratic equation.

MA.A2.BF.A.1

Students will be able to convert between Standard form and Vertex Form of a Quadratic equation.

MA.A2.IF.A.2

Students will be able to graph a quadratic function in Standard Form.

MA.A2.IF.A.1

Students will be able to analyze the Standard Form of a Quadratic equation in order to solve real world/application problems.

MA.A2.FM.A.1

Students will be able to find the vertex of a Quadratic function in Standard Form.

MA.A2.IF.A.1

TOPIC: **Modeling with Quadratic Functions (Section 4.3) -- 2 Day(s)**Description**

Students will focus on how create a quadratic equation from 3 unique coordinate points. Students will also be introduced to Quadratic Regressions and learn about when to use Quadratic Regressions opposed to Linear Regressions (from Section 2.5).

**This section will only be covered by Advanced Algebra 2 due to the fact that this is a direct application of Systems of Three variables (Section 3.5) which Algebra 2 students did not cover.

Academic Vocabulary (What terms will students need to know?)

Quadratic Regression

Learning Targets**TOPIC: Factoring Quadratic Expressions (Section 4.4)** -- 4 Day(s)**Description**

Students will focus on how to factor quadratic equations. Students will factor by finding the greatest common factor, the possible binomial factors, and using the AC method. Students will also learn how to factor special quadratic expressions such as difference of two squares and perfect square trinomials.

Academic Vocabulary (What terms will students need to know?)

Factoring

Greatest Common Factor (GCF) of an expression

Perfect Square Trinomial

Difference of Two Squares

Learning Targets

Students will be able to rewrite a quadratic function in its factored form using a variety of factoring methods.

MA.A2.NQ.A.3

TOPIC: Quadratic Equations (Section 4.5) -- 2 Day(s)

Description

Students will learn how to apply factoring to a quadratic equation in order to find the x-intercepts. Students will also solve quadratic equations graphically.

Academic Vocabulary (What terms will students need to know?)

Zero of a Function
Zero-Product Property

Learning Targets

Students will be able to use the method of Completing the Square to transform a Quadratic equation in Standard Form to Vertex Form.

MA.A2.IF.A.2

Students will be able to graph quadratic equations from its factored form.

MA.A2.APR.A.1

Students will be able to solve quadratic equations from its factored form.

MA.A2.APR.A.1

TOPIC: Completing the Square (Section 4.6) -- 3 Day(s)

Description

Students will learn how to make any quadratic equation into a perfect square trinomial equation by completing the square. Students will then return to thinking about vertex form of quadratic equations and learn how the process of completing the square can change a quadratic equation in standard form into vertex form.

Academic Vocabulary (What terms will students need to know?)

Completing the Square

Learning Targets

Students will be able to use the method of Completing the Square to transform a Quadratic equation in Standard Form to Vertex Form.

MA.A2.IF.A.2

Students will be able to find zeros, extreme values and symmetry of the graph using the method of Completing the Square.

MA.A2.IF.A.1

TOPIC: The Quadratic Formula (Section 4.7) -- 2 Day(s)

Description

Students will learn about the quadratic formula and why it is a necessary tool in order to find the (irrational) zeros of some quadratic equations. Students will also learn about the discriminant and understand what that means about the number of real solutions a quadratic equation has.

Academic Vocabulary (What terms will students need to know?)

Quadratic Formula
Discriminant

Learning Targets

TOPIC: Complex Numbers (Section 4.8) -- 2 Day(s)**Description**

Students will broaden their understanding of numbers by learning about complex numbers in this section. Continuing from their knowledge about discriminants and the number of REAL solutions a quadratic equation has, students will know learn what imaginary or non-REAL solutions are. Students will learn about the imaginary unit "i" and how that relates to to the Complex system of numbers. With in this section students will also learn how to numerically operate (add, subtract, multiply, and divide) with complex numbers, as well as, finding complex conjugates, graphing complex numbers, and finding the absolute value of complex numbers.

Academic Vocabulary (What terms will students need to know?)

Imaginary Unit " i "
Imaginary Number
Complex Number
Pure Imaginary Number
Complex Number Plane
Absolute Value of a Complex Number
Complex Conjugates

Learning Targets

Students will be able to represent complex numbers in the correct form $(a+bi)$

MA.A2.NQ.B.5

Students will be able to add, subtract, multiply, and divide complex numbers.

MA.A2.NQ.B.6

Students will be able to solve quadratic equations with real coefficients that have complex solutions.

MA.A2.REI.A.1

Students will be able to write the solution of a polynomial in factored form.

Such as $x^2+4=0 \rightarrow (x+2i)(x-2i)$

MA.A2.APR.A.1

TOPIC: Quadratic Systems (Section 4.9) -- 2 Day(s)**Description**

Students will focus on how to graph systems of equations involving quadratic equations. They will also learn about the possible numbers of solutions with quadratic systems of equation. Finally, students will learn how to graph systems of inequalities involving quadratic equations.

Academic Vocabulary (What terms will students need to know?)

No new Academic Vocabulary

Learning Targets

Students will be able to solve systems of inequalities that include quadratic equations.

MA.A2.REI.B.3

UNIT: Polynomial and Radical Functions (5.1 - 5.9) -- 19 Day(s)**Unit Description**

This unit covers all of Chapter 5 (5.1 - 5.9) and the first half of Chapter 6 (6.1 - 6.3).

In this unit, students will continue to find the zeros of polynomial equations by finding their zeros of functions higher than quadratics. Students will find zeros of quadratics by polynomial/synthetic division. Students will also be able to graph polynomial functions. Finally, students will begin working with radical functions, operations between radical functions, and graphing radical functions.

We have omitted Sections 5.7 (not covered on MLS), 5.8 (only Models on MLS are Linear, Quadratic, and Exponential) during the 2016-2017 School Year.

Academic Vocabulary**Section 5.1**

Algebra II/ Advanced Algebra II (2016)

Wright City R-II
Mathematics
Grades 10 - 12, Duration 1 Year, 1 Credit
Required Course

Monomial
Degree of a Monomial
Polynomial
Degree of a Polynomial
Polynomial Function
Standard Form of a Polynomial
Turning Point
End Behavior

Section 5.2

Factor Theorem
Multiple Zero
Multiplicity
Relative Maximum
Relative Minimum

Section 5.3

**Sum of Cubes
**Difference of Cubes

Section 5.4

Polynomial Long Division
Synthetic Division
Remainder Theorem

Section 5.5

Rational Root Theorem
Conjugate Root Theorem
**Descartes' Rule of Signs

Section 5.6

Fundamental Theorem of Algebra

Section 5.9

Power Function
Constant of Proportionality

TOPIC: Polynomial Functions (Section 5.1) -- 2 Day(s)

Description

In this section, students will learn how to classify polynomials, graph polynomial functions and describe end behavior.

Academic Vocabulary (What terms will students need to know?)

Monomial

Degree of a Monomial

Polynomial

Degree of a Polynomial

Polynomial Function

Standard Form of a Polynomial

Turning Point

End Behavior

Learning Targets

Students will be able to identify the End Behavior of any polynomial function or graph.

Students will know that an even polynomial has an end behavior of up and up if the leading coefficient is positive or an end behavior of down and down if the leading coefficient is negative.

Students will know that an odd polynomial has an end behavior of down and up if the leading coefficient is positive or an end behavior of up and down if the leading coefficient is negative.

MA.A2.IF.A.1

Students will be able to explain how multiplicity of a zero effects the graph of a polynomial.

If there is only one instance of the zero, the zero has a multiplicity of 1. If there is are two or more instance of the zero, the zero has a multiplicity of 2+.

MA.A2.IF.A.1

TOPIC: Polynomials, Linear Factors, and Zeros (Section 5.2) -- 2 Day(s)**Description**

In this section students will analyze the factored form of a polynomial. they will also, write a polynomial function from its zeros.

Academic Vocabulary (What terms will students need to know?)

Factor Theorem

Multiple Zero

Multiplicity

Relative Maximum

Relative Minimum

Learning Targets

Students will be able to determine the multiplicity of every zero of a polynomial in factored form.

MA.A2.IF.A.1

Students will be able to identify all of the zeros (x-intercepts) of a polynomial in factored form.

MA.A2.APR.A.5

Students will be able to use zeros to sketch the polynomial function.

Students will also need to be familiar with the effects of end behavior and multiplicity to correctly sketch the graph.

MA.A2.APR.A.5

Students will be able to determine if a polynomial function has a relative maximum or minimum.

MA.A2.IF.A.1

Students will be able to use Synthetic Division to factor 2nd degree and higher polynomials.

MA.A2.IF.A.1

TOPIC: Solving Polynomial Equations (Section 5.3) -- 3 Day(s)**Description**

In this section, students will apply what they learned in Section 5.2 while solving polynomials by factoring. Students will also solve polynomial equations by graphing.

** Sum and Difference of Cubes will only be covered by Advanced Algebra 2 classes.

Academic Vocabulary (What terms will students need to know?)

**Sum of Cubes

**Difference of Cubes

Learning Targets

Students will be able to factor polynomials with suitable factorizations.

Factorizations can include complex numbers as long as students can find these factorizations using the quadratic formula.

MA.A2.APR.A.5

Students will be able to determine the zeros of a polynomial function using a graph.

MA.A2.IF.A.1

TOPIC: Dividing Polynomials (section 5.4) -- 4 Day(s)**Description**

In this section students will learn how to divide polynomials both through long division and synthetic division.

Academic Vocabulary (What terms will students need to know?)

Polynomial Long Division

Synthetic Division

Remainder Theorem

Learning Targets

Students will be able to use Long Division to factor 2nd degree and higher polynomials.

MA.A2.APR.A.2

Students will be able to use Synthetic Division to factor 2nd degree and higher polynomials.

MA.A2.APR.A.2

Students will be able to write the result of a polynomial division problem as a quotient with a remainder.

MA.A2.APR.A.2

Students will be able to determine whether a binomial is a factor of a polynomial using polynomial Long or Synthetic division.

Application of the Remainder Theorem.

After Long/Synthetic Division, if the remainder is 0, the binomial is a factor.

MA.A2.APR.A.2

TOPIC: Theorems about Roots of Polynomial Equations (Section 5.5) -- 3 Day(s)**Description**

In this section students will learn how to solve equations using the Rational Root Theorem. Students will also be able to solve problems using the Conjugate Root Theorem.

Students in Advanced Algebra 2 will also learn Descartes' Rule of Signs.

Academic Vocabulary (What terms will students need to know?)

Rational Root Theorem

Conjugate Root Theorem

**Descartes' Rule of Signs

Learning Targets

Students will be able to use the Rational Root Theorem to find all rational factors of a polynomial function.

MA.A2.APR.A.1

Students will be able to use the Conjugate Root Theorem to find all irrational and complex factors of a polynomial function.

MA.A2.APR.A.1

TOPIC: The Fundamental Theorem of Algebra (Section 5.6) -- 3 Day(s)**Description**

Students will learn how to identify how many real and/or imaginary solutions a polynomial equation has, and solve polynomial equations with complex solutions by the Fundamental Theorem of Algebra.

Academic Vocabulary (What terms will students need to know?)

Fundamental Theorem of Algebra

Learning Targets

Students will be able to use the Fundamental Theorem of Algebra to determine the number of real and complex zeros a polynomial function has.

MA.A2.NQ.B.7

TOPIC: Roots and Radical Expressions (Section 6.1) -- 1 Day(s)

Description

Students will review radical expressions and extend their knowledge from square/cube roots and learn how to take the "nth" root of an expression.

Academic Vocabulary (What terms will students need to know?)

nth Root

Principal Root

Learning Targets

Students will be able to identify the transformations of any polynomial function written in vertex form.

MA.A2.BF.A.3

Students will be able to identify the transformations of any graphed polynomial function.

MA.A2.BF.A.3

UNIT: Rational Exponents (6.1 - 6.8) -- 20 Day(s)

Unit Description

This unit covers all of Chapter 6 (6.1 - 6.8).

In this unit, students will focus on radical expressions and equations. Including the use of rational exponents. Students will also learn to graph rational functions and explore the inverse relationship between exponents and radicals.

Academic Vocabulary

Section 6.1

nth Root

Principal Root

Radicand

Index

Section 6.2

Simplest Form of a Radical

Rationalize the Denominator

Section 6.3

Like Radicals

Section 6.4

Rational Exponent

Section 6.5

Radical Equation

Square Root Equation

Section 6.6

Composite Functions

Section 6.7

Inverse Relation

Inverse Function

One-to-One Function

Section 6.8

Radical Function

Square Root Function

TOPIC: Roots and Radical Expressions (Section 6.1) -- 1 Day(s)

Description

Students will review radical expressions and extend their knowledge from square/cube roots and learn how to take the "nth" root of an expression.

Academic Vocabulary (What terms will students need to know?)

nth Root
Principal Root
Radicand
Index

Learning Targets

Students will be able to simplify radical expressions of any nth root.

MA.A2.NQ.A.2

TOPIC: Multiplying and Dividing Radical Expressions (Section 6.2) -- 3 Day(s)

Description

In this section, students will learn how to multiply and divide rational expressions. They will also learn how to simplify radicals and rationalize the denominator of a fraction..

Academic Vocabulary (What terms will students need to know?)

Simplest Form of a Radical
Rationalize the Denominator

Learning Targets

Students will be able to multiply radical expressions of any root.

Indices (type of root) must be the same in order to multiply.

Coefficients (numbers outside radicals) multiply with other coefficients.

Radicands (numbers inside radicals) multiply with other radicands.

MA.A2.NQ.A.3

Students will be able to divide radical expressions of any root.

Indices (type of root) must be the same in order to divide.

Coefficients (numbers outside radicals) multiply with other coefficients.

Radicands (numbers inside radicals) multiply with other radicands.

MA.A2.NQ.A.3

Students will be able to rationalize denominators of any root.

If rationalizing a cube root, students must multiply by a cube root such that the product radicand is a perfect cube.

MA.A2.NQ.A.3

TOPIC: Adding and Subtracting Radical Expressions (Section 6.3) -- 2 Day(s)**Description**

In this section, students will learn how to add and subtract radical expressions. Similar to fractions and adding/subtracting only fractions with like denominators, students will learn they need to like radicals in order to combine rational expressions with addition/subtraction.

Academic Vocabulary (What terms will students need to know?)

Like Radicals

Learning Targets

Students will be able to add and subtract radical expressions of any root.

Indices (type of root) and Radicands (inside of root) must be the same in order to add/subtract.

Coefficients (numbers outside radicals) add/subtract with other coefficients.

Radicands stay the same.

MA.A2.NQ.A.3

Students will be able to multiply/divide two functions together to create a new function with adjusted domain.

MA.A2.NQ.A.3

TOPIC: Rational Functions (Section 6.4) -- 3 Day(s)**Description**

In this section students will learn to simplify expressions with rational (fractional) exponents.

Academic Vocabulary (What terms will students need to know?)

Rational Exponent

Learning Targets

Students will be able to write a radical expression as an exponential expression using rational exponents.

Power/root

MA.A2.NQ.A.1

Students will be able to simplify radical expressions using rational exponents and exponential rules.

MA.A2.NQ.A.1

Students will be able to convert radical expressions into an equivalent form using rational exponents and vice versa.

MA.A2.NQ.A.2

TOPIC: Solving Square Root and Other Radical Equations (Section 6.5) -- 4 Day(s)**Description**

In this section, students will review how to solve square root equations and extend that knowledge in solving "higher" radical equations. Make sure to mention how \sqrt{x} is equivalent to $2\sqrt{x}$

Academic Vocabulary (What terms will students need to know?)

Radical Equation

Square Root Equation

Learning Targets

Students will be able to solve equations that have rational exponents, by using the reciprocal of the exponent.

MA.A2.NQ.A.4

Students will be able to identify the type of radical equations that could have extraneous solutions.

MA.A2.NQ.A.4

TOPIC: Function Operations (Section 6.6) -- 2 Day(s)**Description**

In this section students will work on adding, subtracting, multiplying, and dividing functions. Students will also learn about composite functions and learn how to solve problems involving composite functions.

Academic Vocabulary (What terms will students need to know?)

Composite Functions

Learning Targets

Students will be able to add/subtract two functions together to create a new function with adjusted domain.

MA.A2.BF.A.1

Students will be able to multiply/divide two functions together to create a new function with adjusted domain.

MA.A2.BF.A.1

Students will be able to compose two functions together to create a new function with adjusted domain.

MA.A2.BF.A.1

TOPIC: Inverse Relations and Functions (Section 6.7) -- 2 Day(s)**Description**

In this section, students will learn how to find the inverse of a relation or function. It is here that they will see the connection between square-root functions and quadratics.

Academic Vocabulary (What terms will students need to know?)

Inverse Relation

Inverse Function

One-to-One Function

Learning Targets

Students will be able to find the inverse of a function.

MA.A2.BF.A.2

Students will be able to prove that two functions are inverses using composition.

MA.A2.BF.A.2

TOPIC: Graphing Rational Functions (Section 6.8) -- 3 Day(s)**Description**

In this section, students will learn how to graph square root and other radical functions. They will also review the transformations/translations of functions again this time specifically aligned to radical functions. This will help solidify the information presented in Section 6.7 about the inverse relationship between Square Root and Quadratic Functions.

Academic Vocabulary (What terms will students need to know?)

Radical Function

Square Root Function

Learning Targets

Students will be able to identify the transformations of any root function written in vertex form.

MA.A2.BF.A.3

Students will be able to identify the transformations of any graphed root function.

MA.A2.BF.A.3

UNIT: Exponential and Logarithmic Functions (7.1 - 7.6) -- 17 Day(s)**Unit Description**

This unit covers all of Chapter 7 (7.1 - 7.6).

In this unit, students will focus on exponential and logarithmic functions. Students will learn a variety of properties for both and also be able to graph and calculate values of both exponential and logarithmic functions. Students will also explore how logarithmic functions are the inverse to exponential functions.

Academic Vocabulary

Section 7.1

Radical Function
Square Root Function

Section 7.2

Natural Base Exponential Function
Continuously Compounded Interest

Section 7.3

Logarithm
Logarithmic Function
Common Logarithm (base 10)
Logarithmic Scale

Section 7.4

Change of Base Formula

Section 7.5

Exponential Equation
Logarithmic Equation

Section 7.6

Natural Logarithm (base e)
Natural Logarithmic Function

TOPIC: Exploring Exponential Models (Section 7.1) -- 2 Day(s)

Description

In this section, students will be re-introduced to the exponential function and its graphical shape. Students will also learn about the difference between growth and decay factors and how they change the look of the graph.

Academic Vocabulary (What terms will students need to know?)

Exponential Function
Exponential Growth
Exponential Decay
Asymptote
Growth Factor
Decay Factor

Learning Targets

Students will be able to find the y-intercept of any exponential function.

MA.A2.IF.A.1

Students will be able to differentiate between exponential growth and decay functions graphically and by the functions themselves.

MA.A2.IF.A.1

Students will be able to identify the rate of growth/decay of exponential functions.

MA.A2.IF.A.1

TOPIC: Properties of Exponential Functions (Section 7.2) -- 4 Day(s)**Description**

In this section, students will explore the properties of functions of the form $y=ab^x$. Students will also be able to graph exponential functions that have base e .

Academic Vocabulary (What terms will students need to know?)

Natural Base Exponential Function
Continuously Compounded Interest

Learning Targets

Students will be able to graph exponential functions.

MA.A2.NQ.A.2

Students will be able to read the exact value of a number on a logarithmic scale.

MA.A2.BF.A.3

TOPIC: Logarithmic Functions as Inverses (Section 7.3) -- 2 Day(s)**Description**

In this section, students will learn how to write and evaluate logarithmic expressions. Students will also understand how logarithmic functions are their inverses to exponential functions. Finally, students will be able to graph logarithmic functions.

Academic Vocabulary (What terms will students need to know?)

Logarithm
Logarithmic Function
Common Logarithm (base 10)
Logarithmic Scale

Learning Targets

Students will be able to evaluate logarithmic expressions.

MA.A2.SSE.A.1

Students will be able to write an exponential equation in logarithmic form.

MA.A2.SSE.A.1

Students will be able to explain how exponential and logarithmic equations are related.

MA.A2.SSE.A.2

TOPIC: Properties of Logarithms (Section 7.4) -- 3 Day(s)**Description**

In this section, students will learn about the various properties of logarithms and how to use them to expand and condense logarithmic expressions.

Academic Vocabulary (What terms will students need to know?)

Change of Base Formula

Learning Targets

Students will be able to use the properties of logarithms to expand logarithmic equations.

MA.A2.SSE.A.3

Students will be able to use the properties of logarithms to condense logarithmic equations.

MA.A2.SSE.A.3

Students will be able to use the change of base formula to simplify logarithmic equations.

MA.A2.SSE.A.3

Students will be able to use logarithmic scales to condense large values into smaller understandable values.

MA.A2.SSE.A.4

Students will be able to read the exact value of a number on a logarithmic scale.

MA.A2.SSE.A.4

TOPIC: Exponential and Logarithmic Equations (Section 7.5) -- 4 Day(s)**Description**

In this section, students will learn how to use the properties they have learned about exponents and logarithms to solve both exponential and logarithmic equations.

Academic Vocabulary (What terms will students need to know?)

Exponential Equation

Logarithmic Equation

Learning Targets

Students will be able to use an exponent to undo a logarithmic equation.

MA.A2.SSE.A.2

Students will be able to use an logarithm to undo a exponential equation.

MA.A2.SSE.A.2

TOPIC: Natural Logarithms (Section 7.6) -- 2 Day(s)**Description**

In this section, students will learn how to simplify natural logarithmic expressions. Students will also solve equations using natural logarithms.

Academic Vocabulary (What terms will students need to know?)

Natural Logarithm (base e)

Natural Logarithmic Function

Learning Targets

Students will be able to describe the differences between natural, common, and logs of different bases.

MA.A2.SSE.A.1

UNIT: Logarithmic and Rational Functions (8.3 - 8.6) -- 13 Day(s)**Unit Description**

This unit covers all of Chapter 8 (8.3 - 8.6).

In this unit, students will learn how to graph/operate with rational functions.

Sections 8.1 (have talked about inverses and variations previously) and 8.2 (reciprocal functions are the basic form of a rational function and will be covered throughout the rest of the chapter) have been omitted during the 2016-2017 school year.

Academic Vocabulary**Section 8.3**

Rational Function

Continuous Graph

Discontinuous Graph

Point of Discontinuity

Non-Removable Discontinuity

Section 8.4

Rational Expression

Simplest Form of a Rational Expression

Section 8.5

Complex Fraction

Section 8.6

Rational Equation

TOPIC: Rational Functions and Their Graph (Section 8.3) -- 4 Day(s)**Description**

In this section, students will learn how to identify properties of rational exponents. Students will also learn how to graph rational functions.

Academic Vocabulary (What terms will students need to know?)

Rational Function

Continuous Graph

Discontinuous Graph

Point of Discontinuity

Non-Removable Discontinuity

Learning Targets

Students will be able to identify points of discontinuities created by a rational function.

Removable discontinuities when the linear factor of the denominator can be canceled out with a linear factor of the numerator. (Holes)

Non-Removable discontinuities when the linear factor of the denominator cannot be canceled. (Vertical Asymptotes)

MA.A2.BF.A.3

Students will be able to identify vertical asymptotes created by a rational function.

MA.A2.BF.A.3

Students will be able to identify horizontal asymptotes created by a rational function.

MA.A2.BF.A.3

Students will be able to identify that rational functions are two functions that have been divided to make a new function.

MA.A2.APR.A.1

TOPIC: Rational Expressions (Section 8.4) -- 2 Day(s)**Description**

In this section, students will learn how to simplify rational expressions using the factoring rules they learned in Chapter 4. Students will also learn how to combine rational functions with multiplication and division.

Academic Vocabulary (What terms will students need to know?)

Rational Expression

Simplest Form of a Rational Expression

Learning Targets

Students will be able to multiply/divide rational expressions.

MA.A2.APR.A.4

Students will be able to simplify rational expressions.

MA.A2.APR.A.4

TOPIC: Adding and Subtracting Rational Expressions (Section 8.5) -- 4 Day(s)**Description**

In this section, students will learn how to add and subtract rational functions. This is very similar to the rules of adding and subtracting fractions, except rather than numbers we now have entire functions in the numerator and denominator.

Academic Vocabulary (What terms will students need to know?)

Complex Fraction

Learning Targets

Students will be able to add/subtract rational expressions.

MA.A2.APR.A.4

Students will be able to find the least common multiple of the denominators of two rational functions.

MA.A2.APR.A.3

TOPIC: Probability (Section 11.2/3) -- 3 Day(s)

Description

In this section students will find the probability of an event using theoretical, experimental, and simulation methods. Students

Academic Vocabulary (What terms will students need to know?)

Section 11.2

Learning Targets

Students will be able to solve rational equations where numerators and denominators are polynomials.

MA.A2.REI.A.2

Students will be able to identify when rational equations will have extraneous solutions.

MA.A2.REI.A.2

UNIT: Probability and Data Analysis (11.3 - 11.10) -- 15 Day(s)

Unit Description

This unit covers parts of Chapter 11 (11.1 - 11.10).

In this unit, students will gain a basic understanding of algebraic probability. The students will learn about probability topics such as random sampling, data sets, mathematical models. Students will also analyze data using standard deviations, and comparing models to a normal distribution.

Enduring Understandings/Essential Learner Outcomes

Students will be able to use technology to analyze data and make predictions using their analysis.

Academic Vocabulary

Section 11.2

Experimental Probability

Simulation

Sample Space

Equally Likely Outcomes

Theoretical Probability

Section 11.5

Probability Model

Consistent Data

Inconsistent Data

Section 11.6

TOPIC: Probability (Section 11.2/3) -- 3 Day(s)

Description

In this section students will find the probability of an event using theoretical, experimental, and simulation methods. Students will also determine whether models are consistent with data sets.

Academic Vocabulary (What terms will students need to know?)

Section 11.2

Experimental Probability

Simulation

Sample Space

Equally Likely Outcomes

Theoretical Probability

Section 11.3

Dependent Events

Independent Events

Mutually Exclusive Events

From Section 11.3 Concept Byte

Probability Distribution

Uniform Distribution

Cumulative Frequency

Cumulative Probability

Learning Targets

Students will find the experimental probability of an event.

MA.A2.DS.A.6

Students will find the theoretical probability of an event.

MA.A2.DS.A.6

Students will analyze data to determine if it is consistent with a specific model and vice versa.

MA.A2.DS.A.2

TOPIC: Probability Models (Section 11.5) -- 3 Day(s)

Description

In this section students will use probabilities to make fair decisions and analyze situations. Students will also determine whether a given model is consistent/inconsistent with a set of data.

Academic Vocabulary (What terms will students need to know?)

Probability Model

Consistent Data

Inconsistent Data

Learning Targets

Students will be able to use a probability model to make predictions of a real-world event.

MA.A2.DS.A.6

Students will be able to determine if data is consistent/inconsistent with a given model.

MA.A2.DS.A.2

TOPIC: Basic Analyzing Data (Section 11.6) -- 2 Day(s)

Description

In this section students will review previous probability model concepts such as mean, median, mode and range, as well as, box-and-whisker plots and quartiles.

Academic Vocabulary (What terms will students need to know?)

Section 11.6

Measure of Central Tendency

Mean

Median

Mode

Bimodal

Range (of a data set)

Outlier

Quartile

Interquartile Range

Box-and-Whisker Plot

Percentile

Learning Targets

Students will be able to analyze data sets using mean, median, mode, range and quartiles.

MA.A2.DS.A.6

TOPIC: Standard Deviation (Section 11.7) -- 2 Day(s)

Description

In this section students will learn about standard deviation as a process of more precisely analyzing data.

Academic Vocabulary (What terms will students need to know?)

measure of variation

Variance

Standard Deviation

Learning Targets

Students will be able to find the standard deviation of a data set.

MA.A2.DS.B.8

TOPIC: Samples and Surveys (Section 11.8) -- 3 Day(s)

Description

In this section students will learn the difference between samples and populations. They will also learn the probability behind random samples.

Academic Vocabulary (What terms will students need to know?)

Population
Sample
Convenience Sample
Self-selected Sample
Systematic Sample
Random Sample
bias
Observational Study
Controlled Experiment
Survey

Learning Targets

Students will be able to analyze how random sampling could be used to make inferences about population parameters.

MA.A2.DS.A.1

Students will be able to calculate of the margin of error in estimates created by various sampling methods (e.g. convenience, self-selected, systematic, and random samples).

MA.A2.DS.A.4

Students will be able to recognize the meaning of the margin of error in estimates created by various sampling methods (e.g. convenience, self-selected, systematic, and random samples).

MA.A2.DS.A.3

TOPIC: Normal Distributions -- 2 Day(s)

Description

In this section students will learn what a normal distribution is and analyze various data sets compared to a normal distribution.

Academic Vocabulary (What terms will students need to know?)

Discrete probability distribution
continuous probability distribution
normal distribution

Learning Targets

Students will be able to fit a data set to a distribution using its mean and standard deviation to determine whether the data is approximately normally distributed.

MA.A2.DS.B.9

Students will be able to recognize the meaning of the margin of error in estimates created by various sampling methods (e.g. convenience, self-selected, systematic, and random samples).

MA.A2.DS.A.5