

Independent School District of Boise City

Accelerated Algebra 2

District Course Number: #0816

Course Description:

Open to: Grade 10, One Year Course

Prerequisite: C or better in Accelerated Geometry, or Instructor/Counselor approval

Content: Students will study concepts of algebra, geometry, logic, and statistics as they are extended and integrated with circular, exponential and logarithmic functions.

Adopted materials:

Title: Algebra and Trigonometry: Structure and Method Book 2

Edition: 2000

Publisher: McDougal Littell

ISBN: 0-395-97725-8

Course Scope for Semester I

<u>Unit 1:</u> Basic Concepts of Algebra	1 week
<u>Unit 2:</u> Inequalities and Proofs	1 week
<u>Unit 3:</u> Linear Equations and Functions	3 weeks
<u>Unit 4:</u> Products & Factors of Polynomials	2.5 weeks
<u>Unit 5:</u> Rational Expressions	2 weeks
<u>Unit 6:</u> Irrational and Complex Numbers	3 weeks
<u>Unit 7:</u> Quadratic Equations & Functions	3 weeks

Course Scope for Semester II

<u>Unit 8:</u> Variations & Polynomial Equations	2 weeks
<u>Unit 9:</u> Analytic Geometry	2.5 weeks
<u>Unit 10:</u> Exponential and Logarithmic Functions	3 weeks
<u>Unit 11:</u> Triangle Trigonometry	3.5 weeks
<u>Unit 12:</u> Trigonometric Graphs	1 week
<u>Unit 13:</u> Statistics	1 week
<u>Unit 14:</u> Matrices and Determinants	3.5 weeks

Accelerated Algebra 2		District Reference	
		0816	
Unit I	Basic Concepts of Algebra	Semester 1, 1 week	

Instructional Objective		Standard Reference	
0816.01 Understand properties of the real number system.		AII.1.1.1	
No.	Performance Objective	Resource Reference	Assessment Correlation

01	Explain the similarities and differences in the subsystems of real numbers.	Text: Chapter 1 Section 2	
Instructional Objective		Standard Reference	
0816.02 Use the proper order of operations. Perform operations with real numbers.		AII.1.1.2	
No.	Performance Objective	Resource Reference	Assessment Correlation
01	Use the order of operations to simplify numerical expressions.	Text: Chapter 1 Section 3 through 6	EOC
Instructional Objective		Standard Reference	
0816.03 Understand and use variables, expressions, equations, and inequalities.			
No.	Performance Objective	Resource Reference	Assessment Correlation
01	Translate an English phrase or sentence into an algebraic expression or equation and vice versa.	Text: Chapter 1 Section 8	
02	Evaluate an algebraic expression using rational numbers.	Text: Chapter 1 Section 2	EOC
Instructional Objective		Standard Reference	
0816.04 Use appropriate procedures to simplify and solve polynomial equations and inequalities.		AII.3.2.2	
No.	Performance Objective	Resource Reference	Assessment Correlation
01	Solve equations in one variable.	Text: Chapter 1 Sections 2 through 7 and 9	EOC

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Unit II	Inequalities and Proof	Semester 1, 1 week

Instructional Objective		Standard Reference	
0816.05 Understand and use appropriate procedures to solve linear equations and inequalities.		AII.3.2.2	
No.	Performance Objective	Resource Reference	Assessment Correlation
01	Use equations with one variable to solve word problems.	Text: Chapter 1 Section 8 and 9	
02	Solve compound and absolute value inequalities and equations.	Text: Chapter 2, Section 2 and 4	EOC
03	Solve equations and inequalities with one variable and recognize the solutions when graphed or when written in set notation.	Text: Chapter 2, Section 1	
04	Solve inequalities with one variable in word problems	Text: Chapter 2, Section 1 and 3	
05	Recognize an inequality on a number line.	Text: Chapter 2,	

		Section 1 and 3	
06	Solve absolute value equations.	Text: Chapter 2, Section 4	EOC
07	Solve compound inequalities and equations.	Text: Chapter 2, Section 2	EOC
08	Solve compound and absolute value inequalities and equations.	Text: Chapter 2, Section 4 and 5	EOC
Instructional Objective		Standard Reference	
0816.06 Use the proper order of operations. Perform operations with real numbers.			
No.	Performance Objective	Resource Reference	Assessment Correlation
01	Simplify numerical expressions using absolute value.	Text: Chapter 2 Section 4	
Instructional Objective		Standard Reference	
0816.07 Use a variety of methods, including common mathematical formulas, to solve problems drawn from daily life.			
No.	Performance Objective	Resource Reference	Assessment Correlation
01	Recognize and use an inequality in a problem situation.	Text: Chapter 2 Section 3	EOC
02	Apply algebra, geometry, and other mathematical strands together in order to solve real world problems using mathematical language and representation.	Text: Chapter 2 Sections 3	EOC
Instructional Objective		Standard Reference	
0816.08 Use appropriate vocabulary to communicate mathematical information.			
No.	Performance Objective	Resource Reference	Assessment Correlation
01	Use axioms, definitions, and theorems to prove properties of real numbers.	Text: Chapter 2 Section 6	TMA
02	Use axioms, definitions, and theorems to prove properties of inequalities and absolute values.	Text: Chapter 2 Sections 7	TMA
Instructional Objective		Standard Reference	
0816.09 Represent a set of data in a table, a graph, and as a mathematical relationship.		AII.3.1.1, AII.3.1.2.c, AII.3.2.2.a, AII.3.4.1.b	
No.	Performance Objective	Resource Reference	Assessment Correlation
01	Graph linear and absolute value equations and determine the equations from a graph.	Text: Chapter 2 Section 1 and 5	EOC
02	Identify the graph of a linear or absolute value equation.	Text: Chapter 2 Sections 2	EOC
03	Graph linear or absolute value inequalities and determine an inequality from a graph.	Text: Chapter 2, Section 5	

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Unit III	Linear Equations and Functions	Semester 1, 3 week

Instructional Objective		Standard Reference	
0816.10 Understand concepts of the Cartesian Coordinate System.		AII.3.2.1, AII.3.4.1.b	
No.	Performance Objective	Resource Reference	Assessment Correlation
01	Graph horizontal and vertical lines, given the equation.	Text: Chapter 3 Section 2	TMAEOC
02	Find the x and y intercepts of a linear equation.	Text: Chapter 3 Section 2	TMAEOC
03	Determine the slope of a line using the slope formula, the equation of the line, or the graph of an equation.	Text: Chapter 3 Section 2 and 3	EOC
04	Graph a linear equation with two variables.	Text: Chapter 3 Section 2 and 3	EOC
05	Determine the linear equation of a line using the slope, y-intercept, or coordinates and will compare the slopes of parallel and perpendicular lines.	Text: Chapter 3 Section 4 and 5	EOC
06	Graph an inequality of more than one variable.	Text: Chapter 3 Section 7	EOC
07	Identify inequalities by observing their graph.	Text: Chapter 3 Section 7	
Instructional Objective		Standard Reference	
0816.11 Understand units and their relationship to one another and to real world applications.			
No.	Performance Objective	Resource Reference	Assessment Correlation
01	Use measurement in word problems.	Text: Chapter 3 Sections 6 and 9	
Instructional Objective		Standard Reference	
0816.12 Understand and use appropriate procedures to solve linear equations and inequalities.		AII.3.2.2	
No.	Performance Objective	Resource Reference	Assessment Correlation
01	Write solutions in set notation.	Text: Chapter 3 Section 10	TMA, EOC
Instructional Objective		Standard Reference	
0816.13 Represent a set of data in a table, a graph, and as a mathematical relationship.		AII.3.1.1, AII.3.1.1.a, AII.3.4.1.d	
No.	Performance Objective	Resource Reference	Assessment Correlation
01	Graph absolute value functions.	Text: Chapter 3 Section 7	TMA, EOC

02	Identify the graph of an solute value function and explain the effect of a transformation on a graph.	Text: Chapter 3 Section 10	
03	Use calculators, computers, and graphing utilities in problem solving.	Text: Chapter 3, Section 7	
Instructional Objective 0816.14 Understand and use appropriate procedures to solve simple linear systems of equations and inequalities.		Standard Reference AII.3.1.1	
No.	Performance Objective	Resource Reference	Assessment Correlation
01	Graph a system of linear equations involving two variables.	Text: Chapter 3 Section 5	EOC
02	Solve systems of linear equations with two variables.	Text: Chapter 3 Section 5	EOC
03	Find the solution for a set of linear equations and determine if the equations are consistent/inconsistent or dependent/independent.	Text: Chapter 3 Section 5	
04	Use a graphing utility to solve systems of linear equations by graphing.	Text: Chapter 3 Section 1a	TMA
05	Solve systems of linear inequalities.	Text: Chapter 3 Section 5	EOC
Instructional Objective 0816.15 Use a variety of methods, including common mathematical formulas, to solve problems drawn from daily life.		Standard Reference	
No.	Performance Objective	Resource Reference	Assessment Correlation
01	Create a system of inequalities from a problem and solve it using linear programming.	Text: Chapter 3 Extension, page 159	
02	Apply algebra, geometry, and other mathematical strands together in order to solve real world problems using mathematical language and representation.	Text: Chapter 3 Section 6	EOC
Instructional Objective 0816.16 Use appropriate technology to employ simulation techniques, curve fitting, correlation, and graphical models to make predictions or decisions based on data.		Standard Reference	
No.	Performance Objective	Resource Reference	Assessment Correlation
01	Use calculators, computers, and graphing utilities in problem solving.	Text: Chapter 3, Sections 8 through 10	
Instructional Objective 0816.17 Model real-world phenomena using polynomial, rational, and basic exponential functions, noting restricted domains.		Standard Reference AII.3.1.1	
No.	Performance Objective	Resource Reference	Assessment Correlation
01	Determine the domain and range of a function.	Text: Chapter 3 Sections 10	

02	Determine if a graph, a set or ordered pairs, a table, or a mapping represents a function.	Text: Chapter 3 Sections 10	
03	Find the domain and range of a function given its graph.	Text: Chapter 3 Sections 10	
04	Find the domain and range of a function given the function rule.	Text: Chapter 3 Sections 10	
05	Find the range of a function given its domain.	Text: Chapter 3 Sections 10	

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Unit IV	Products and Factors of Polynomials	Semester 1, 2 – 2.5 weeks

Instructional Objective		Standard Reference	
0816.18 Understand and use procedures for operating on algebraic expressions.		AII.1.3.2	
No.	Performance Objective	Resource Reference	Assessment Correlation
01	Simplify polynomial expressions by performing operations, including advanced monomial division	Text: Chapter 4 Sections 1 through 4	
Instructional Objective		Standard Reference	
0816.19 Use appropriate procedures to simplify and solve polynomial equations and inequalities.		AII.3.2.2.f	
No.	Performance Objective	Resource Reference	Assessment Correlation
01	Factor simple polynomials.	Text: Chapter 4 Section 5	EOC
02	Factor various trinomials.	Text: Chapter 4 Section 5	TMAEOC
03	Factor polynomials, including perfect squares, perfect square trinomials and the sum and difference of two cubes.	Text: Chapter 4, Section 5 and 6	EOC
04	Factor by grouping.	Text: Chapter 4 Section 5	TMA
05	Solve problems using polynomial equations and inequalities.	Text: Chapter 4 Section 7 through 9	EOC
Instructional Objective		Standard Reference	
0816.20 Understand properties of roots, exponents and logarithms.		AII.1.1.4,AII.1.3.1	
No.	Performance Objective	Resource Reference	Assessment Correlation
01	Evaluate an expression using exponents.	Text: Chapter 4, Section 2	

Instructional Objective 0816.21 Use appropriate procedures to simplify and solve polynomial equations and inequalities.			Standard Reference AII.3.2.2, AII.3.1.1.b
No.	Performance Objective	Resource Reference	Assessment Correlation
01	Solve and graph quadratic inequalities.	Text: Chapter 4 Section 9	
02	Graph solutions to a quadratic inequality on a number line.	Text: Chapter 4, Section 9	

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Unit V	Rational Expressions	Semester 1, 2 weeks

Instructional Objective 0816.22 Understand and use positive and negative numbers, fractions, decimals, percentages, and scientific notation.			Standard Reference AII.1.1.1
No.	Performance Objective	Resource Reference	Assessment Correlation
01	Convert numbers from scientific notation (including those with negative exponents) to the standard form and vice versa.	Text: Chapter 5 Section 3	
02	Perform operations on numbers written in scientific notation.	Text: Chapter 5 Section 3	

Instructional Objective 0816.23 Understand and use procedures for operating on algebraic expressions.			Standard Reference
No.	Performance Objective	Resource Reference	Assessment Correlation
01	Perform operations on numerical expressions containing integral and fractional exponents.	Text: Chapter 5 Sections 1 through 3	EOC

Instructional Objective 0816.24 Understand and use procedures for operating on algebraic expressions.			Standard Reference AII.1.3.1, AII.1.3.1.d.e
No.	Performance Objective	Resource Reference	Assessment Correlation
01	Simplify radical expressions containing variables.	Text: Chapter 5 Section 4	EOC
02	Reduce fractions with positive and negative exponents in the denominator.	Text: Chapter 5 Section 2	EOC
03	Perform operations on numbers containing integral and fractional exponents.	Text: Chapter 5 Sections 3, 4, 8 and 9	EOC
04	Simplify expressions containing negative or fractional exponents.	Text: Chapter 5 Sections 2 and 8	EOC

Instructional Objective		Standard Reference	
0816.25 Represent a set of data in a table, a graph, and as a mathematical relationship.		AII.3.1.2,AII.3.1.1, AII.3.4.1.b	
No.	Performance Objective	Resource Reference	Assessment Correlation
01	With or without a graphing calculator, graph rational functions and identify the vertical and horizontal asymptotes.	Text: Chapter 5 Section 4	EOC
Instructional Objective		Standard Reference	
0816.26 Understand and use proportions, ratios, and scaling.			
No.	Performance Objective	Resource Reference	Assessment Correlation
01	Solve fractional equations.	Text: Chapter 5 Section 9	EOC
Instructional Objective		Standard Reference	
0816.27 Understand and use procedures for operating on algebraic expressions.		AII.3.2.2, AII.1.3.2.d	
No.	Performance Objective	Resource Reference	Assessment Correlation
01	Use operations to simplify and evaluate rational expressions with monomial and polynomial denominators.	Text: Chapter 5 Section 4 through 6	EOC
02	Simplify complex fractions that contain rational expressions in numerator and/or denominator.	Text: Chapter 5, Section 7	TMA, EOC
Instructional Objective		Standard Reference	
0816.28 Use appropriate procedures to simplify and solve polynomial equations and inequalities.		AII.3.2.2.c	
No.	Performance Objective	Resource Reference	Assessment Correlation
01	Solve rational equations.	Text: Chapter 5 Section 8 and 9	TMA, EOC

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Unit VI	Irrational and Complex Numbers	Semester 1, 3 weeks

Instructional Objective		Standard Reference	
0816.29 Understand properties of roots, exponents, and logarithms		AII.1.3.1.b	
No.	Performance Objective	Resource Reference	Assessment Correlation
01	Perform operations on number sentences containing radicals.	Text: Chapter 6 Section 1 and 2	EOC
Instructional Objective		Standard Reference	
0816.30 Understand and use procedures for operating on algebraic expressions.		AII.1.1.1.a.b.c, AII.1.3.1.b.c, AII.1.3.2.e	
No.	Performance Objective	Resource Reference	Assessment

			Correlation
01	Perform operations with expressions containing radicals.	Text: Chapter 6, Sections 3 and 4	EOC
02	Simplify expressions involving imaginary or complex numbers, including radical expressions involving negative radicands.	Text: Chapter 6, Sections 6 through 8	EOC
03	Add, subtract, multiply, and divide complex numbers.	Text: Chapter 6, Sections 7 and 8	EOC
Instructional Objective		Standard Reference	
0816.31 Use appropriate procedures to simplify and solve polynomial equations and inequalities.		AII.3.2.2.b, AII.3.4.1.b	
No.	Performance Objective	Resource Reference	Assessment Correlation
01	Solve radical equations.	Text: Chapter 6 Section 5	EOC
02	Solve fractional and radical equations.	Text: Chapter 6 Section 5 and 7	EOC

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Unit VII	Quadratic Equations and Inequalities	Semester 1, 3 weeks

Instructional Objective		Standard Reference	
0816.32 Use appropriate procedures to simplify and solve polynomial equations and inequalities.		AII.3.2.2, AII.4.2.1, AII.1.1.2.a, AII.3.1.1.b.c, AII.3.1.2.a.b, AII.3.2.2.f	
No.	Performance Objective	Resource Reference	Assessment Correlation
01	Graph quadratic equations.	Text: Chapter 7 Section 5 2	EOC
02	Graph a quadratic equation, determine the maximum or minimum point, and find the zeros with or without a graphing utility.	Text: Chapter 7 Section 5 and 6	EOC
03	Solve quadratic equations by factoring, completing the square, or using the quadratic formula.	Text: Chapter 7 Sections 1 and 2	EOC
04	Use the discriminant to determine the roots of a quadratic.	Text: Chapter 7 Section 3	EOC
05	Solve quadratic equations when solutions are complex.	Text: Chapter 7 Sections 4	TMA, EOC
06	Determine a quadratic equation or its coordinates from a graph.	Text: Chapter 7 Sections 5	
07	Solve word problems using quadratic equations.	Text: Chapter 7 Sections 7	
08	Use quadratic methods to solve non-quadratic equations.	Text: Chapter 7 Section 7	EOC

Instructional Objective		Standard Reference	
0816.33 Use appropriate technology to employ simulation techniques, curve fitting, correlation, and graphical models to make predictions or decisions based on data.			
No.	Performance Objective	Resource Reference	Assessment Correlation
01	Use calculators, computers, and graphing utilities in problem solving.	Text: Chapter 7 Sections 5 and 6	
Instructional Objective		Standard Reference	
0816.34 Represent a set of data in a table, a graph, and as a mathematical relationship.		AII.3.4.1.a.b	
No.	Performance Objective	Resource Reference	Assessment Correlation
01	Recognize and explain how the graph of a quadratic equation changes as the coefficients in the equation change.	Text: Chapter 7 Section 5	
02	Restate an equation in an alternate form or standard form.	Text: Chapter 7 Section 4	EOC
Instructional Objective		Standard Reference	
0816.35 Model real-world phenomena using polynomial, rational, and basic exponential functions, noting restricted domains.		AII.3.2.1	
No.	Performance Objective	Resource Reference	Assessment Correlation
01	Determine a quadratic equation or its coordinates from a graph.	Text: Chapter 7 Sections 5	

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Unit VIII	Variations and Polynomial Equations	Semester 2, 2 weeks

Instructional Objective		Standard Reference	
0816.36 Understand and use proportions, ratios, and scaling.			
No.	Performance Objective	Resource Reference	Assessment Correlation
01	Solve direct, inverse, and joint variation problems.	Text: Chapter 8 Section 1 and 2	TMA, EOC
Instructional Objective		Standard Reference	
0816.37 Understand and use procedures for operating on algebraic expressions.		AII.1.3.2, AII.1.3.2.c, AII.3.1.2.d	
No.	Performance Objective	Resource Reference	Assessment Correlation
01	Perform long division on polynomials to determine remainders, roots, and factors.	Text: Chapter 8 Section 3	TMA
02	Perform synthetic division on polynomials to determine remainders, roots, and factors.	Text: Chapter 8 Sections 4	TMA, EOC

Instructional Objective		Standard Reference	
0816.38 Use appropriate procedures to simplify and solve polynomial equations and inequalities.		AII.3.1.2.e.f, AII.3.2.2.g, AII.3.4.1.b	
No.	Performance Objective	Resource Reference	Assessment Correlation
01	Find remaining factors of a polynomial when given one of the factors.	Text: Chapter 8 Section 5	TMA, EOC
02	Use Descarte’s Rule of Signs to determine the possible combinations of root types.	Text: Chapter 8 Sections 6	TMA
03	Solve polynomial equations of degree two or greater.	Text: Chapter 6 Section 7	EOC
04	Use a graphing calculator to find polynomial roots.	Text: Chapter 8, Section 8	TMA
Instructional Objective		Standard Reference	
0816.39 Model real-world phenomena using polynomial, rational, and basic exponential functions, noting restricted domains.		AII.1.1.2	
No.	Performance Objective	Resource Reference	Assessment Correlation
01	Determine the equation of a polynomial, given its roots.	Text: Chapter 8 Section 5	TMA, EOC
02	Describe the characteristics and properties of classes of functions.	Text: Chapter 8 Sections 8	

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Unit IX	Analytic Geometry	Semester 2, 2.5 weeks

Instructional Objective		Standard Reference	
0816.40 Understand concepts of the Cartesian Coordinate System.		AII.3.1.1.e, AII.3.2.1.a, AII.4.2.1.a	
No.	Performance Objective	Resource Reference	Assessment Correlation
01	Use the distance formula to find the distance between two points.	Text: Chapter 9 Section 1	
02	Find the midpoint of a segment, given its endpoints.	Text: Chapter 9, Section 1	
03	Write the equation of a circle, parabola, ellipse, or hyperbola in standard form.	Text: Chapter 9 Section 2 through 6	TMA, EOC
04	Identify and describe the graphs and equations of circles, parabolas, ellipses, and hyperbolas.	Text: Chapter 9, Sections 2 through 6	
05	Determine the equation of a parabola, circle, ellipse, or hyperbola, given the graph.	Text: Chapter 9, Sections 2 through 6	
06	Convert equations to standard form, if necessary, and then determine the characteristics of a circle (e.g. center and radius).	Text: Chapter 9, Sections 2 and 6	TMA, EOC
07	Convert equations to standard form, if necessary,	Text: Chapter 9,	EOC

	and then determine the characteristics of a parabola (e.g. focus, directrix, vertex, axis of symmetry, and direction of opening).	Sections 3 and 6	
08	Convert equations to standard form, if necessary, and then determine the characteristics of an ellipse (e.g. center, foci, length of major and minor axes, and vertices).	Text: Chapter 9, Sections 4 and 6	TMA
09	Convert equations to standard form, if necessary, and then determine the characteristics of a hyperbola (e.g. center, foci, and equation of asymptotes).	Text: Chapter 9, Sections 5 and 6	TMA
Instructional Objective		Standard Reference	
0816.41 Represent a set of data in a table, a graph, and as a mathematical relationship.			
No.	Performance Objective	Resource Reference	Assessment Correlation
01	Restate an equation in an alternate form or standard form.	Text: Chapter 9 Section 2 through 6	EOC
Instructional Objective		Standard Reference	
0816.42 Use appropriate technology to employ simulation techniques, curve fitting, correlation, and graphical models to make predictions or decisions based on data.			
No.	Performance Objective	Resource Reference	Assessment Correlation
01	Use graphs to determine the estimates for and the number of real solutions of quadratic systems.	Text: Chapter 9, Sections 7 and 8	

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Unit X	Exponential and Logarithmic Functions	Semester 2, 3 weeks

Instructional Objective		Standard Reference	
0816.43 Represent a set of data in a table, a graph, and as a mathematical relationship.		AII.1.1.4,AII.1.3.1, AII.1.1.4.a.b, AII.1.3.1.a.f	
No.	Performance Objective	Resource Reference	Assessment Correlation
01	Create tables, graphs, and ordered pairs from a function.	Text: Chapter 10, Section 3	
Instructional Objective		Standard Reference	
0816.44 Understand and use proportions, ratios, and scaling. Model real-world phenomena using polynomial, rational, and basic exponential functions, noting restricted domains.		AII.1.3.2.b	
No.	Performance Objective	Resource Reference	Assessment Correlation
01	Perform operations on functions (e.g. sum, product, and composition of functions) and justify	Text: Chapter 10, Section 3	EOC

	the steps used.		
02	Identify a function and its inverse from ordered pairs, equations, and graphs.	Text: Chapter 10, Section 3	EOC
03	Perform compositions of two or more functions, and then evaluate them for either numerical or variable values.	Text: Chapter 10, Section 3	TMA,EOC
04	Define and use natural logarithms.	Text: Chapter 10, Section 8	TMA
05	Use exponential functions to solve exponential growth and decay problems.	Text: Chapter 10, Section 7	EOC

Instructional Objective		Standard Reference	
0816.45 Understand and use procedures for operating on algebraic expressions.		AII.3.1.1.d, AII.1.1.4.a	

No.	Performance Objective	Resource Reference	Assessment Correlation
01	Convert fractional exponents into radical notation.	Text: Chapter 10, Section 1	TMA
02	Simplify and solve equations involving irrational exponents.	Text: Chapter 10, Section 2	TMA
03	Convert a logarithmic equation to an exponential equation and vice versa.	Text: Chapter 10, Section 4	EOC
04	Use the properties of logarithms to simplify logarithmic expressions.	Text: Chapter 10, Section 5	EOC
05	Use logarithms and antilogarithms to convert an expression to an equivalent expression.	Text: Chapter 10, Section 6	EOC

Instructional Objective		Standard Reference	
0816.46 Use appropriate procedures to simplify and solve polynomial equations and inequalities.		AII.3.2.2.d.e	

No.	Performance Objective	Resource Reference	Assessment Correlation
01	Solve logarithmic and exponential equations.	Text: Chapter 10, Sections 5 and 6	EOC
02	Solve equations involving variables inside logarithms or as exponents.	Text: Chapter 10, Section 6	TMA, EOC

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Unit XI	Triangle Trigonometry	Semester 2, 3 weeks	

Instructional Objective		Standard Reference	
0816.47 Know and apply the Pythagorean Theorem to solve real world problems.		AII.4.1.1	

No.	Performance Objective	Resource Reference	Assessment Correlation
01	Use the Pythagorean Theorem to solve problems involving triangles.	Text: Chapter 9, Section 1 and	EOC

		Chapter 12, Section 2	
Instructional Objective		Standard Reference	
0816.48 Understand the basic concepts of right triangle trigonometry (basic trigonometry ratios such as sine, cosine, and tangent).		AII.4.1.1	
No.	Performance Objective	Resource Reference	Assessment Correlation
01	Use right triangle trigonometry.	Text: Chapter 12 Section 2 and 5	EOC
02	Use the definitions of trigonometric functions to find the sine, cosine, tangent, cotangent, secant, and cosecant of an angle.	Text: Chapter 12 Section 2 through 4	EOC
Instructional Objective		Standard Reference	
0816.49 Use trigonometric ratio methods to solve problems.		AII.4.1.1.a	
No.	Performance Objective	Resource Reference	Assessment Correlation
01	Find coterminal angle measurements for a specified angle.	Chapter 12, Section 1	TMA
02	Solve word problems involving the missing sides and angles of right triangles using trigonometric ratios.	Text: Chapter 12, Section 5	
03	Solve non-right triangles using the Law of Sines or the Law of Cosines.	Text: Chapter 12, Sections 6 through 8	TMA,EOC
04	Find values of expressions involving inverse trigonometric functions.	Text: Chapter 14, Section 6	TMA, EOC

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Unit XII	Trigonometric Graphs; Identities	Semester 2, 1 week

Instructional Objective		Standard Reference	
0816.50 Understand equivalent units, comparable units, and conversions.		AII.2.1.1.a	
No.	Performance Objective	Resource Reference	Assessment Correlation
01	Perform conversions between radians and degrees.	Text: Chapter 13, Section 1	TMA,EOC
Instructional Objective		Standard Reference	
R0817.51 Represent a set of data in a table, a graph, and as a mathematical relationship.			
No.	Performance Objective	Resource Reference	Assessment Correlation
01	Graph the six basic trigonometric functions and identify the period, amplitude, and asymptotes when applicable.	Text: Chapter 13, Sections 3 through 5	TMA
02	Recognize changes in a function resulting in horizontal or vertical shifts or reflections about an	Text: Chapter 13, Sections 3 through 5	TMA

	axis.		
Instructional Objective		Standard Reference	
0816.52 Use trigonometric ratio methods to solve problems.			
No.	Performance Objective	Resource Reference	Assessment Correlation
01	Use the unit circle to find exact trigonometric values of general angles.	Text: Chapter 13, Section 2	TMA,EOC
02	Apply special triangle relationships to solve problems involving triangles.	Text: Chapter 13, Section 2	EOC

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Unit XIII	Statistics and Probability	Semester 2, 1 week

Instructional Objective		Standard Reference	
0816.53 Understand basic statistical concepts including mean (average), median, mode, range, and standard deviation.			
No.	Performance Objective	Resource Reference	Assessment Correlation
01	Calculate the mean, median, mode and range of a set of data.	Text: Chapter 15, Section 1	EOC
02	Find the standard deviation.	Text: Chapter 15, Section 2	TMA
03	Solve problems involving normally distributed data.	Text: Chapter 15, Section 3	TMA

Instructional Objective		Standard Reference	
0816.54 Collect and organize data, and display the data in tables, charts, and graphs (scatter diagrams, frequency tables, bar graphs, or pie charts).			
No.	Performance Objective	Resource Reference	Assessment Correlation
01	Construct or interpret graphs, charts, and other forms of organized data.	Text: Chapter 15, Sections 1 through 3	
02	Create scatter plots.	Text: Chapter 15, Section 4	TMA
03	Choose or construct the appropriate graph (line graph, box and whisker plot, histogram, bar graph) to display data.	Text: Chapter 15, Sections 1 through 4	
04	Perform statistical analysis on data, given a stem-and-leaf plot or box-and-whisker plot.	Text: Chapter 15, Sections 1 and 2	TMA,EOC

Instructional Objective		Standard Reference	
0816.55 Read and interpret tables, charts, and graphs (scatter plots, line graphs, three-dimensional graphs, and pie charts).			
No.	Performance Objective	Resource Reference	Assessment Correlation
01	With or without a calculator, choose the equation	Text: Chapter 15,	

	that best represents the line of regression when applied to a statistical model represented by a scatter plot.	Section 4	
Instructional Objective 0816.56 Use appropriate technology to employ simulation techniques, curve fitting, correlation, and graphical models to make predictions or decisions based on data.		Standard Reference	
No.	Performance Objective	Resource Reference	Assessment Correlation
01	Use calculators, computers, and graphing utilities in problem solving.	Text: Chapter 15, Section 4	
Instructional Objective 0816.57 Represent a set of data in a table, a graph, and as a mathematical relationship.		Standard Reference	
No.	Performance Objective	Resource Reference	Assessment Correlation
01	Draw a graph to represent a problem situation or write a possible problem situation that a graph could represent.	Text: Chapter 15, Section 1 through 4	

Accelerated Algebra 2		District Reference 0816
Unit XIV	Matrices and Determinants	Semester 2, 3–3.5 weeks

Instructional Objective 0816.58 Understand and use appropriate procedures to solve simple linear systems of equations and inequalities.		Standard Reference AII.1.2.1.a,AII.1.1.3.a	
No.	Performance Objective	Resource Reference	Assessment Correlation
01	Solve systems of three linear equations with or without matrices.	Text: Chapter 16, page 785	
Instructional Objective 0816.59 Use graphs, matrices, and sequences to represent and solve problems.		Standard Reference AII.1.3.2.a	
No.	Performance Objective	Resource Reference	Assessment Correlation
01	Solve matrix equations for variable elements by setting corresponding elements equal to each other.	Text: Chapter 16, Section 1	TMA,EOC
02	Use addition and subtraction of matrices to do transformations of geometric figures.	Text: Chapter 16, Section 2	
03	Perform operations (e.g. addition, subtraction, scalar multiplication, multiplication, determinants, and inverses) on a set of matrices, with or without a graphing calculator.	Text: Chapter 16, Sections 2 through 9	EOC

04	Use matrices to represent figures in algebraic equations or graphs on the coordinate plane.	Text: Chapter 16, Section 4	
05	Identify and calculate inverse matrices.	Text: Chapter 16, Sections 5 and 6	EOC
06	Use the properties of zero when solving matrices.	Text: Chapter 16, Section 6	EOC
07	Use matrices to solve word problems.	Text: Chapter 16, Section 4	

**IDAHO CONTENT STANDARDS
ALGEBRA II
MATHEMATICS**

Students are expected to know content and apply skills from Algebra I and prior math courses.

Mathematical reasoning and problem solving processes will be incorporated throughout all mathematics standards. When solving problems, students should think ahead about a strategy, form conjectures, test ideas with special cases, try different approaches, check for errors and reasonableness of solutions as a regular part of routine work, and devise independent ways to verify results. Students will demonstrate knowledge and communicate mathematical thinking through words, numbers, symbols, charts, graphs, tables, diagrams, and models.

Objectives provide the focus for this course. They will be taught using a variety of methods and applications so that students attain a deep understanding of these concepts and are able to apply them to solve contextual situations.

Skill Statements provide clarity and direction to achieve each objective. Students need to demonstrate proficiency in these skills upon completion of this course.

The appropriate use of technological tools is encouraged to assist students in solving problems and the formation and testing of conjectures.

Standard 1: Number and Operation

Goal 1.1: Understand numbers, ways of representing numbers, relationships among numbers, and number system.

Objective(s): By the end of Algebra II, the student will be able to:

AII.1.1.1 Compare and contrast the properties of numbers and number systems within the complex number system to include rational, irrational, and imaginary numbers and factorials.

Skill Statements:

- a. Define and explain the meaning of i as a solution to the equation $x^2 = -1$.
- b. Identify expressions of the form $a + bi$ as complex numbers.
- c. Identify complex conjugates.
- d. Demonstrate the meaning of $x!$.

AII.1.1.2 Demonstrate meaning of complex numbers as solutions to polynomial equations that do not have real solutions.

Skill Statements:

- a. Identify real and imaginary roots for polynomial equations.

AII.1.1.3 Recognize matrices as a method of arranging data.

Skill Statement:

- a. Identify the dimensions of a matrix.

AII.1.1.4 Develop an understanding of the properties of logarithmic expressions and expressions with rational exponents.

Skill Statements:

- a. Identify a logarithmic function as the inverse of an exponential function.
- b. Convert between expressions containing radical form and those containing rational exponents.

Goal 1.2: Understand meanings of operations and how they relate to one another.

Objective(s): By the end of Algebra II, the student will be able to:

AII.1.2.1 Develop an understanding of the properties of, and representations for, the addition, subtraction, and multiplication of matrices.

Skill Statement:

- a. Identify which real number properties apply to matrices.

Goal 1.3: Compute fluently and make reasonable estimates.

Objective(s): By the end of Algebra II, the student will be able to:

AII.1.3.1 Simplify expressions within the complex number system.

Skill Statements:

- a. Simplify rational expressions, expressions with rational exponents, and logarithmic expressions.
- b. Simplify and estimate radical expressions having various indices.
- c. Express the square root of a negative number in the form bi , where b is real.
- d. Simplify complex fractions.
- e. Convert between radical expressions and expressions with rational exponents.
- f. Use properties of logarithms to evaluate and simplify logarithmic expressions.

AII.1.3.2 Perform computations on expressions ~~with matrices~~ within the complex number system.

Skill Statements:

- a. Perform operations with matrices to include scalar multiplication, addition, subtraction, and matrix multiplication (2 by 2).
- b. Add, subtract, and multiply radical expressions and expressions containing rational exponents.
- c. Use long division or synthetic division to divide a polynomial by a lower degree polynomial.
- d. Add, subtract, multiply, and divide rational expressions.
- e. Perform computations ~~with complex numbers~~ in the complex number system.

Standard 2: Concepts and Principles of Measurement

Goal 2.1: Understand measurable attributes of objects and the units, systems, and processes of measurement.

Objective(s): By the end of Algebra II, the student will be able to:

AII.2.1.1 Recognize the relationship between radian and degree measures.

Skill Statements:

- a. Convert between degree and radian measures.

Goal 2.2: Apply appropriate techniques, tools, and formulas to determine measurements.

Objective(s): By the end of Algebra II, the student will be able to:

No objectives at this course level.

<u>Suggested Vocabulary and Symbols</u>
radian measure

Standard 3: Concepts and Language of Algebra and Functions

Goal 3.1: Understand patterns, relations, and functions.

Objective(s): By the end of Algebra II, the student will be able to:

AII.3.1.1 Represent patterns and functional relationships in a table and as a graph.

Skill Statements:

- a. Graph absolute value functions.
- b. Graph quadratic equations and inequalities.
- c. Graph polynomial functions.
- d. Graph exponential functions.

- e. Graph circles.

AII.3.1.2 Describe the graphs of polynomial and absolute value functions and discuss their attributes in terms of the basic concepts of maximum, minimum, intercepts, and roots.

Skill Statements:

- a. Determine the nature of the roots of an equation by using the discriminant.
- b. Recognize contexts in which quadratic models are appropriate.
- c. Identify the graphs of absolute value functions and identify their key characteristics.
- d. Identify a polynomial function by its degree.
- e. Identify the graphs of polynomial functions.
- f. Relate the solutions of polynomial functions to the points where the graphs cross the x-axis.

Goal 3.2: Represent and analyze mathematical situations and structures using algebraic symbols.

Objective(s): By the end of Algebra II, the student will be able to:

AII.3.2.1 Write equations and inequalities in multiple forms.

Skill Statement:

- a. Rewrite equations of parabolas and circles in standard form.

AII.3.2.2 Recognize and generate equivalent forms of algebraic expressions and solve equations, inequalities, and systems of equations and inequalities.

Skill Statements:

- a. Solve systems of linear equations and linear inequalities.
- b. Solve radical equations and inequalities.
- c. Solve rational equations.
- d. Solve logarithmic equations.
- e. Solve equations containing a variable in the exponent.
- f. Use the quadratic formula, factoring, and completing the square to solve any quadratic equations.
- g. Find all roots of polynomials functions using various methods.

Goal 3.3: Use mathematical models to represent and understand quantitative relationships.

Objective(s): By the end of Algebra II, the student will be able to:

No objectives at this course level.

Goal 3.4: Analyze change in various contexts.

Objective(s): By the end of Algebra II, the student will be able to:

AII.3.4.1 Interpret how changes to an equation affect the parent graph of the equation.

Skill Statements:

- a. Compare and contrast the graphs of $f(x) = x^2$ to $f(x) = a(x-h)^2 + k$.
- b. Recognize graphs of the following and how changes impact them:

$$y = x, y = x^2, y = x^3, y = \frac{1}{x}, y = \sqrt{x}, \text{ and } y = |x|.$$

Suggested Vocabulary and Symbols

complex fraction, rational expression, degree, extraneous roots, inverse, constraints, feasible region, independent variables, dependent variables, factor (verb and noun), zeros of a function, root, domain, range, coincident, consistent systems, inconsistent systems, maximum, minimum, bounded regions, unbounded regions, $f(x)$, discriminant, linear programming, vertex form of a quadratic, synthetic division, synthetic substitution, standard form, parabola, focus of parabola, joint variation, direct variation, inverse variation, exponential growth and decay, cubic, quartic, quadratic, vertex, vertices, focus, directrix, axis of symmetry

Standard 4: Concepts and Principles of Geometry

Goal 4.1 Analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships.

Objective(s): By the end of Algebra II, the student will be able to:

AII.4.1.1 Use trigonometric relationships to determine lengths and angle measures.

Skill Statements:

- a. Demonstrate the proper use of the Law of Sines and the Law of Cosines to solve triangles.

Goal 4.2 Specify locations and describe spatial relationships using coordinate geometry and other representational systems.

AII.4.2.1 Analyze the graphs of circles and parabolas.

Skill Statement:

- a. Graph circles and parabolas and their transformations.

Goal 4.3: Apply transformations and use symmetry to analyze mathematical situations.

No objectives at this course level.

Goal 4.4: Use visualization, spatial reasoning, and geometric models to solve problems.

No objectives at this course level.

Suggested Vocabulary and Symbols

sine, cosine, tangent, secant, cosecant, cotangent

Standard 5: Data Analysis, Probability, and Statistics

No objectives at this course level.