



Integrated Algebra is the first mathematics course in the high school. The algebra course set forth here is not the algebra of 30 years ago. The focal point of this course is the algebra content strand. Algebra provides tools and ways of thinking that are necessary for solving problems in a wide variety of disciplines, such as science, business, social sciences, fine arts, and technology. This course will assist students in developing skills and processes to be applied using a variety of techniques to successfully solve problems in a variety of settings. Problem situations may result in all types of linear equations in one variable, quadratic functions with integral coefficients and roots as well as absolute value and exponential functions. Coordinate geometry will be integrated into the investigation of these functions allowing students to make connections between their analytical and geometrical representations. Problem situations resulting in systems of equations will also be presented. Alternative solution methods should be given equal value within the strategies used for problem solving. For example, a matrix solution to a system of equations is just as valid as a graphical solution or an algebraic algorithm such as elimination. Measurement within a problem-solving context will include calculating rates using appropriate units and converting within measurement systems. Data analysis including measures of central tendency and visual representations of data will be studied. An understanding of correlation and causation will be developed and reasonable lines of best fit will be used to make predictions. Students will solve problem situations requiring right triangle trigonometry. Elementary probability theory will be used to determine the probability of events including independent, dependent and mutually exclusive events.

CROSSWALK

Comparison of 1999 Core Curriculum and 2005 Core Curriculum for High School Mathematics September 2005

The following chart lists the concepts and skills in *Integrated Algebra* (2005 Core) and indicates where it was included in the 1999 Core.

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Number Sense and Operations Strand			
2005 Core Curriculum		1999 Core Curriculum	
Performance Indicator	Concept/Skill	Key Idea	Concept/Skill
A.N.1	Identify and apply properties of real numbers	Math A – 2C Math A – 3D	Properties of real numbers Use field properties to justify mathematical procedures
A.N.2	Simplify radical terms (no variable in radicand)	Math A – 3A	Simplification of radicals
A.N.3	Operations with radicals (using like and unlike radical terms)	Math A – 3A	Operations with radicals
A.N.4	Scientific notation to compute products and quotients	Math A – 3A	Use addition, subtraction, multiplication, division, and exponentiation with real numbers and Algebraic expressions <ul style="list-style-type: none"> • Scientific notation

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Number Sense and Operations Strand			
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Performance Indicator	Concept/Skill	Key Idea	Concept/Skill
A.N.5	Solving Algebraic problems involving fractions, decimals, percents (decrease/increase and discount), and proportionality/direct variation	Math 7/8 – 2B	Understand and apply ratios, proportions, and percents through a wide variety of hands-on explorations <ul style="list-style-type: none"> • Find the percent of a number, calculate the percent of increases and decreases, rate, commissions, taxes, and simple interest
A.N.6	Evaluating expressions involving factorial(s), absolute value(s), and exponential expression(s)	Math A – 3B Math A – 5G Math A – 6D Math 7/8 – 2A Math7/8 – 3A	Use integral exponents on integers and Algebraic expressions Absolute value and the length of a line segment Factorial notation Understand the meaning of absolute value symbol Determine the absolute value of real numbers expanded to include numerical expressions beyond a single value
A.N.7	Fundamental Principle of Counting	Math A – 6C	Counting principle
A.N.8	Permutations	Math A – 6C	Permutations: ${}_nP_n$ and ${}_nP_r$

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Integrated Algebra Strand			
2005 Core Curriculum		1999 Core Curriculum	
Performance Indicator	Concept/Skill	Key Idea	Concept/Skill
A.A.1	Translate: Quantitative verbal phrase into an Algebraic expression	Math A – 4A	Represent problem situations symbolically by using Algebraic expressions
A.A.2	Write: Verbal expression for a given mathematical expression	Math A – 4A	Implied but not explicitly stated
A.A.3	Difference between an Algebraic expression and an Algebraic equation		Not directly addressed
A.A.4	Translate: Verbal sentences into mathematical equations or inequalities	Math A – 4A Math A – 7C	Represent problem situations symbolically by using Algebraic expressions Translate among the verbal descriptions, tables, equations, and graphic forms of functions
A.A.5	Write Algebraic equations or inequalities that represent a situation	Math A – 4A Math A – 7C	Implied but not explicitly stated Translate linear functions and inequalities between representations that are verbal descriptions, tables, equations, or graphs
A.A.6	Analyze and solve verbal problems whose solution requires solving a linear equation in one variable or linear inequality in one variable	Math A – 7B	Graphic and Algebraic solutions of linear function in the solution of problems
A.A.7	Analyze and solve verbal problems whose solution requires solving systems of linear equations in two variables	Math A – 7A Math A – 7E	Graphic solution of systems of linear equations and inequalities (problem solving implied) Solve systems of linear equations (problem solving implied)
A.A.8	Analyze and solve verbal problems that involve quadratic equations	Math A – 7B	Graphic and Algebraic solutions of quadratic function in the solution of problems

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Performance Indicator	Concept/Skill	Key Idea	Concept/Skill
A.A.9	Analyze and solve verbal problems that involve exponential growth and decay	Math 7/8 – 7C	Use Algebraic expressions, equations, and inequalities to model exponential growth
A.A.10	Algebraic solution of a system of two linear equations in two variables	Math A – 7A Math A – 4E	Algebraic solution of systems of linear equations by substitution method and addition-subtraction method Model real world problems with systems of equations <ul style="list-style-type: none"> • Systems of linear equations
A.A.11	Solve a system of one linear and one quadratic equation in two variables (only factoring required and the quadratic equation should represent a parabola and the solution should be integers)	Math A – 7A	Algebraic solution of a system of equations – one linear and one quadratic
A.A.12	Multiplication/Division of monomials expressions with a common base using the properties of exponents (integral exponents only)	Math A – 3A	Products of monomials (division by monomials not specifically addressed as such)
A.A.13	Add, subtract, and multiply monomials and polynomials	Math A – 3A	Addition and subtraction of polynomials: combining like terms Multiplication of polynomials: powers, products of monomials and binomials
A.A.14	Divide a polynomial by a monomial or binomial (quotient has no remainder)	Math A – 3A	Division of polynomials by monomials – no mention of division by binomial
A.A.15	Find values of a variable for which an Algebraic fraction is undefined		Not specifically addressed

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2005 Core Curriculum		1999 Core Curriculum	
Performance Indicator	Concept/Skill	Key Idea	Concept/Skill
A.A.16	Simplify fractions with polynomials in the numerator and denominator by factoring both (simplify answer)	Math A – 3A	Simplification of fractions – polynomials in numerator and denominator not mentioned
A.A.17	Add/Subtract fractional expressions with monomial or like binomial denominators	Math A – 3A	Addition and subtraction of fractions with like denominators – no mention of binomial denominators
A.A.18	Multiply/Divide Algebraic fractions and express answer in simplest form	Math A – 3A	Multiplication and division of fractions
A.A.19	Identify and factor the difference of two perfect squares	Math A – 3A	Difference of two squares
A.A.20	Complete factoring (including trinomials with a lead coefficient of one (after factoring a GCF)	Math A – 3A	Factoring: common monomials, binomial factors of trinomials- no mention of complete factoring
A.A.21	Verifying a value as a solution to a linear equation or inequality in one variable	Math 7/8 – 7E	Verify results of substituting variables <ul style="list-style-type: none"> • Solve an equation and check the solution by substitution
A.A.22	Solution of all types of linear equations in one variable	Math A – 7E	Solve linear equations with integral, fraction, or decimal coefficients
A.A.23	Solution of literal equations for a given variable	Math A – 4A	Formulas and literal equations
A.A.24	Solution of linear inequalities in one variable	Math A – 7E	Solve linear inequalities
A.A.25	Solve equations involving fractional expressions (fractional expressions result in linear equations in one variable)	Math A – 7E	Solve linear equations with fractional coefficients

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Performance Indicator	Concept/Skill	Key Idea	Concept/Skill
A.A.26	Solution of Algebraic proportions in one variable which result in linear or quadratic equations		Solution of proportional not directly addressed
A.A.27	Use of multiplication property of zero to solve quadratic equations with integral coefficients and integral roots	Math A – 7E	Solve factorable quadratic equations (zero property of multiplication implied)
A.A.28	Relation between roots and factors of a quadratic equation		Not specifically addressed
A.A.29	Set builder notation and/or interval notation to represent the elements of a set		Not addressed
A.A.30	Complement of a set		Not addressed
A.A.31	Intersection of Sets		Not addressed
A.A.32	Slope as a rate of change		Not addressed

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Performance Indicator	Concept/Skill	Key Idea	Concept/Skill
A.A.33	Slope of a line given the coordinates of two points on the line	Math A – 5G	Relate absolute value, distance between two points, and the slope of a line to the coordinate plane
A.A.34	Write the equation of a line, given its slope and the coordinates of a point on the line	Math A – 5G	Equation of a line: point-slope
A.A.35	Write the equation of a line given the coordinates of two points on the line		Not addressed
A.A.36	Write the equation of a line parallel to the x- or y-axis		Not addressed
A.A.37	Determine the slope of a line given its equation in any form	Math A -5G	Equation of a line: point-slope and slope intercept form
A.A.38	Determine if two lines are parallel, given their equation in any form	Math A – 5G	Comparison of parallel and perpendicular lines
A.A.39	Determine whether a given point is on a line , given the equation of the line		Implied in Math A – 7E
A.A.40	Determine whether a given point is in the solution set of a system of linear inequalities		Implied in Math A – 7E
A.A.41	Vertex and axis of symmetry of a parabola		Not specifically addressed

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Performance Indicator	Concept/Skill	Key Idea	Concept/Skill
A.A.42	Trigonometric Ratios of an acute angle of a right triangle	Math A – 5E Math 7/8 – 7J	Right triangle trigonometry Explore and develop basic concepts of right triangle trigonometry <ul style="list-style-type: none"> • Understand the relationships of the sides of a right triangle • Develop and apply the formulas for sine, cosine, and tangent
A.A.43	Find an acute angle of a right triangle given the lengths of its sides	Math A – 5E Math 7/8- 7J	Right triangle trigonometry – Use trigonometry as a method to measure indirectly Develop and apply the formulas for sine, cosine, and tangent
A.A.44	Find the length of a side of a right triangle given the measure of an acute angle and the measure of one side	Math A – 5E Math 7/8 – 7J	Right triangle trigonometry – Use trigonometry as a method to measure indirectly Develop and apply the formulas for sine, cosine, and tangent
A.A.45	Application of Pythagorean theorem	Math 7/8 – 7I	Develop and apply the Pythagorean principle in the solution of problems <ul style="list-style-type: none"> • Use the Pythagorean theorem in the solution of problems

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Geometry Strand			
2005 Core Curriculum		1999 Core Curriculum	
Performance Indicator	Concept/Skill	Key Idea	Concept/Skill
A.G.1	Area/Perimeter of figures composed of polygons, circles, or sectors of circles	Math A – 5A	Perimeter of polygons and circumference of circles Areas of polygons Sectors of a circle not addressed
A.G.2	Volume and Surface Area of regular solids and cylinders	Math A – 5A	Volume of solids
A.G.3	Determine when a relation is a function	Math B – 7A	Determine if a relation is a function
A.G.4	Identify and graph linear, quadratic (parabola), absolute value, and exponential functions	Math A – 7A	Graphs of linear relations: slope and intercept Graphs of conics: circle and parabola
AG.5	How coefficient change in a function effects its graph	Math B – 6B Math B 7D Math B – 4J	Determine the effects of changing the parameters of graphs of linear, quadratic, trigonometric, exponential, and circular functions Analyze the effect of parametric changes on the graphs of functions Determine the effects of changing parameters on the graphs of functions
A.G.6	Graphing linear inequalities		Not directly addressed
A.G.7	Graph and solve systems of linear equations and inequalities (rational coefficients in two variables)	Math A – 7A	Graphic solution of systems of linear equations and inequalities
A.G.8	Graphic solution of a quadratic (parabolic) equation (integral solutions only)	Math A – 7A	Graphs of conics – parabola

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Geometry Strand			
2005 Core Curriculum		1999 Core Curriculum	
Performance Indicator	Concept/Skill	Key Idea	Concept/Skill
A.G.9	Graphic solutions of systems of linear and quadratic equations (solutions whose coordinates are integers)		Not directly addressed
A.G.10	Determine the vertex and axis of symmetry of a parabola given its graph (ordered pair of vertex are integers and integral value for axis of symmetry)		Not directly addressed

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Measurement Strand			
2005 Core Curriculum		1999 Core Curriculum	
Performance Indicator	Concept/Skill	Key Idea	Concept/Skill
A.M.1	Calculations of rate	Math 7/8 – 3G	Determine the unit cost to compare price
A.M.2	Solution of problems involving conversions	Math A – 5B Math A – 5C	Choose and apply appropriate units and tools o measurement situations Converting to equivalent measurements within metric and English measurement systems Dimensional Analysis
A.M.3	Relative error in measuring square and cubic units when error occurs in linear measure	Math A – 5H	Explain the role of error of measurement and its consequence on subsequent calculations Error of measurement and its consequences on calculations of perimeter of polygons and circumference of circles Areas of polygons and circles Volume of solids Percent of error in measurements

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Statistics and Probability Strand			
2005 Core Curriculum		1999 Core Curriculum	
Performance Indicator	Concept/Skill	Key Idea	Concept/Skill
A.S.1	Categorize data as qualitative or quantitative		Not addressed
A.S.2	Determine whether the data to be analyzed is univariate or bivariate		Not addressed
A.S.3	Determine when collected data or display of data may be biased	Math B – 5I	Bias
A.S.4	Compare and contrast the appropriateness of different measures of central tendency for a given data set	Math B – 5I	Choose appropriate statistical measures
A.S.5	Construct a histogram, cumulative frequency histogram, and a box-and-whisker plot, given a set of data	Math A – 5D	Collect and organize data: histogram, cumulative frequency histogram, box-and-whisker plot
A.S.6	Understand how the five statistical summary (minimum, maximum, and the three quartiles) is used to construct a box-and-whisker plot	Math A -5D	Organize data using a box-and-whisker plot
A.S.7	Create a scatter plot of bivariate data	Math A -5D	Collect and organize data: scatter plots
A.S.8	Line of best fit for a scatter plot and its equation	Math B – 5J	Use statistical methods, including scatter plots and lines of best fit, to make predictions <ul style="list-style-type: none"> • Given data, produce scatter plots and lines of best fit
A.S.9	Analyze and interpret a frequency distribution table or histogram, a cumulative frequency distribution table or histogram, or a box-and-whisker plot	Math A – 5D	Use statistical methods including measures of central tendency to describe and compare data

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Performance Indicator	Concept/Skill	Key Idea	Concept/Skill
A.S.10	Evaluate published reports and graphs that are based on data by considering: experimental design, appropriateness of the data analysis, and the soundness of the conclusions		Not specifically addressed
A.S.11	Find the percentile rank of an item in a data set and identify the point values for the first, second, and third quartiles	Math A – 5D	Use statistical methods including the measures of central tendency to describe and compare data <ul style="list-style-type: none"> • Percentiles
A.S.12	Identify the relationship between the independent and dependent variables from a scatter plot (positive, negative, or none)		Implied in Math B – 5J Use statistical methods, including scatter plots and lines of best fit, to make predictions
A.S.13	Understand the difference between correlation and causation		Not addressed
A.S.14	Identify variables that might have a correlation but not a causal relationship		Not addressed
A.S.15	Identify and describe sources of bias and its effect, drawing conclusion from data	Math B – 5I	Design a statistical experiment to study a problem and communicate the outcome, including dispersion <ul style="list-style-type: none"> • Bias
A.S.16	Recognize how linear transformations of one-variable data affect the data’s mean, median, mode, and range		Not directly addressed

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Statistics and Probability Strand			
2005 Core Curriculum		1999 Core Curriculum	
Performance Indicator	Concept/Skill	Key Idea	Concept/Skill
A.S.17	Use a reasonable line of best fit to make a prediction involving interpolation or extrapolation	Math A- 6G Math B – 5J	Make predictions based on interpolations and extrapolations of data Use statistical methods, including scatter plots and lines of best fit, to make predictions
A.S.18	Conditional probability		
A.S.19	Sample space and favorable events	Math A – 6C	Use the concept of random variable in computing probabilities <ul style="list-style-type: none"> • Sample space
A.S.20	Probability of an event and its complement	Math A – 6B	Probability of the complement of an event
A.S.21	Determine empirical probabilities based on specific sample data	Math A – 6A	Theoretical versus empirical probability
A.S.22	Determine, based on calculated probability of a set of events, if: <ul style="list-style-type: none"> • Some or all are equally likely to occur • One is more likely to occur than another • Whether or not an event is certain to happen or not to happen 		Not addressed as specifically as this – might be implied

