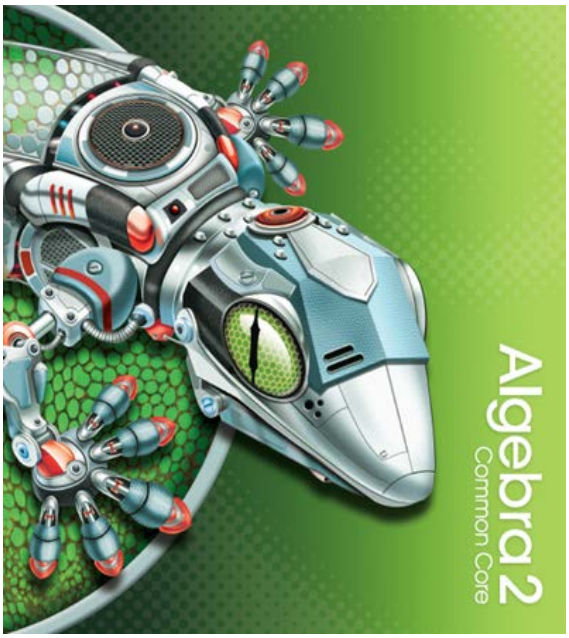
An Alignment of

Minnesota Academic Standards for Mathematics 2007

Minnesota Department of Education

To the Lessons of

Pearson High School Mathematics Algebra 2 Common Core



ALWAYS LEARNING PEARSON

An Alignment of the Minnesota Academic Standards for Mathematics 2007 to *Pearson High School Mathematics – Algebra 2 Common Core*

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An Alignment of the Minnesota Academic Standards for Mathematics 2007 to *Pearson High School Mathematics – Algebra 2 Common Core*

Pearson High School Mathematics Common Core Algebra 2, ©2015	**Minnesota Mathematics K-12 Academic Standards**
Chapter 1	
1-1: Patterns and Expressions	**6.2.1** Recognize and represent relationships between varying quantities; translate from one representation to another; use patterns, tables, graphs and rules to solve real-world and mathematical problems. **5.2.1.1** Create and use rules, tables, spreadsheets and graphs to describe patterns of change and solve problems. **4.2.1.1** Create and use input-output rules involving addition, subtraction, multiplication and division to solve problems in various contexts. Record the inputs and outputs in a chart or table.
1-2: Properties of Real Numbers	**9.2.3.7** Justify steps in generating equivalent expressions by identifying the properties used. Use substitution to check the equality of expressions for some particular values of the variables; recognize that checking with substitution does not guarantee equality of expressions for all values of the variables. **9.2.4.3** Recognize that to solve certain equations, number systems need to be extended from whole numbers to integers, from integers to rational numbers, from rational numbers to real numbers, and from real numbers to complex numbers. In particular, non-real complex numbers are needed to solve some quadratic equations with real coefficients. **8.1.1** Read, write, compare, classify and represent real numbers, and use them to solve problems in various contexts.

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(Continued) 1-2: Properties of Real Numbers	**8.2.3.2** Justify steps in generating equivalent expressions by identifying the properties used, including the properties of algebra. Properties include the associative, commutative and distributive laws, and the order of operations, including grouping symbols. **7.2.3.1** Use properties of algebra to generate equivalent numerical and algebraic expressions containing rational numbers, grouping symbols and whole number exponents. Properties of algebra include associative, commutative and distributive laws. **6.2.2.1** Apply the associative, commutative and distributive properties and order of operations to generate equivalent expressions and to solve problems involving positive rational numbers. **5.2.2.1** Apply the commutative, associative and distributive properties and order of operations to generate equivalent numerical expressions and to solve problems involving whole numbers.
1-3: Algebraic Expressions	**9.2.3.1** Evaluate polynomial and rational expressions and expressions containing radicals and absolute values at specified points in their domains. **9.2.3.6** Apply the properties of positive and negative rational exponents to generate equivalent algebraic expressions, including those involving nth roots. **9.2.3.7** Justify steps in generating equivalent expressions by identifying the properties used. Use substitution to check the equality of expressions for some particular values of the variables; recognize that checking with substitution does not guarantee equality of expressions for all values of the variables.

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(Continued) 1-3: Algebraic Expressions	**8.2.3.1** Evaluate algebraic expressions, including expressions containing radicals and absolute values, at specified values of their variables. **8.2.3.2** Justify steps in generating equivalent expressions by identifying the properties used, including the properties of algebra. Properties include the associative, commutative and distributive laws, and the order of operations, including grouping symbols. **7.2.3.1** Use properties of algebra to generate equivalent numerical and algebraic expressions containing rational numbers, grouping symbols and whole number exponents. Properties of algebra include associative, commutative and distributive laws. **7.2.3.2** Evaluate algebraic expressions containing rational numbers and whole number exponents at specified values of their variables.
1-4: Solving Equations	**8.2.4.2** Solve multi-step equations in one variable. Solve for one variable in a multi-variable equation in terms of the other variables. Justify the steps by identifying the properties of equalities used. **7.2.4.1** Represent relationships in various contexts with equations involving variables and positive and negative rational numbers. Use the properties of equality to solve for the value of a variable. Interpret the solution in the original context. **7.2.4.2** Solve equations resulting from proportional relationships in various contexts. **6.2.3.2** Solve equations involving positive rational numbers using number sense, properties of arithmetic and the idea of maintaining equality on both sides of the equation. Interpret a solution in the original context and assess the reasonableness of results.

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1-5: Solving Inequalities	**9.2.4** Represent real-world and mathematical situations using equations and inequalities involving linear, quadratic, exponential and nth root functions. Solve equations and inequalities symbolically and graphically. Interpret solutions in the original context. **8.2.4.4** Use linear inequalities to represent relationships in various contexts. **8.2.4.5** Solve linear inequalities using properties of inequalities. Graph the solutions on a number line. **7.2.2.4** Represent real-world or mathematical situations using equations and inequalities involving variables and positive and negative rational numbers.
1-6: Absolute Value Equations and Inequalities	**9.2.4.6** Represent relationships in various contexts using absolute value inequalities in two variables; solve them graphically. **8.2.4.6** Represent relationships in various contexts with equations and inequalities involving the absolute value of a linear expression. Solve such equations and inequalities and graph the solutions on a number line.
Chapter 2	
2-1: Relations and Functions	**9.2.2.1** Represent and solve problems in various contexts using linear and quadratic functions. **9.2.1.4** Obtain information and draw conclusions from graphs of functions and other relations.

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(Continued) 2-1: Relations and Functions	**9.2.2** Recognize linear, quadratic, exponential and other common functions in real-world and mathematical situations; represent these functions with tables, verbal descriptions, symbols and graphs; solve problems involving these functions, and explain results in the original context. **8.2.1.1** Understand that a function is a relationship between an independent variable and a dependent variable in which the value of the independent variable determines the value of the dependent variable. Use functional notation, such as f(x), to represent such relationships. **6.2.1.2** Represent the relationship between two varying quantities with function rules, graphs and tables; translate between any two of these representations.
2-2: Direct Variation	**8.2.2.2** Identify graphical properties of linear functions including slopes and intercepts. Know that the slope equals the rate of change, and that the y-intercept is zero when the function represents a proportional relationship. **7.2.1.2** Understand that the graph of a proportional relationship is a line through the origin whose slope is the unit rate (constant of proportionality). Know how to use graphing technology to examine what happens to a line when the unit rate is changed. **7.2.2.1** Represent proportional relationships with tables, verbal descriptions, symbols, equations and graphs; translate from one representation to another. Determine the unit rate (constant of proportionality or slope) given any of these representations. **7.2.2.2** Solve multi-step problems involving proportional relationships in numerous contexts.

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(Continued) 2-2: Direct Variation	**7.2.4.2** Solve equations resulting from proportional relationships in various contexts. **7.2.2.1** Represent proportional relationships with tables, verbal descriptions, symbols, equations and graphs; translate from one representation to another. Determine the unit rate (constant of proportionality or slope) given any of these representations.
2-3: Linear Functions and Slope-Intercept Form	**9.2.2.1** Represent and solve problems in various contexts using linear and quadratic functions. **8.2.1.3** Understand that a function is linear if it can be expressed in the form f (x) = mx + b or if its graph is a straight line. **8.2.2.2** Identify how coefficient changes in the equation f (x) = mx + b affect the graphs of linear functions. Know how to use graphing technology to examine these effects. **8.2.4.3** Express linear equations in slope-intercept, point-slope and standard forms, and convert between these forms. Given sufficient information, find an equation of a line.
2-4: More about Linear Equations	**8.2.4.1** Use linear equations to represent situations involving a constant rate of change, including proportional and non-proportional relationships. **8.2.4.3** Express linear equations in slope-intercept, point-slope and standard forms, and convert between these forms. Given sufficient information, find an equation of a line. **8.3.2.1** Understand and apply the relationships between the slopes of parallel lines and between the slopes of perpendicular lines. Dynamic graphing software may be used to examine these relationships.

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(Continued) 2-4: More about Linear Equations	**8.3.2.3** Given a line on a coordinate system and the coordinates of a point not on the line, find lines through that point that are parallel and perpendicular to the given line, symbolically and graphically.
2-5: Using Linear Models	**9.2.2.1** Represent and solve problems in various contexts using linear and quadratic functions. **8.2.1.2** Use linear functions to represent relationships in which changing the input variable by some amount leads to a change in the output variable that is a constant times that amount. **8.2.2.1** Represent linear functions with tables, verbal descriptions, symbols, equations and graphs; translate from one representation to another.
2-6: Families of Functions	**9.2.2** Recognize linear, quadratic, exponential and other common functions in real-world and mathematical situations; represent these functions with tables, verbal descriptions, symbols and graphs; solve problems involving these functions, and explain results in the original context. **9.2.2.1** Represent and solve problems in various contexts using linear and quadratic functions. **8.2.1.2** Use linear functions to represent relationships in which changing the input variable by some amount leads to a change in the output variable that is a constant times that amount. **8.2.2.1** Represent linear functions with tables, verbal descriptions, symbols, equations and graphs; translate from one representation to another. **8.2.2.2** Identify how coefficient changes in the equation f(x) = mx + b affect the graphs of linear functions. Know how to use graphing technology to examine these effects.

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2-7: Absolute Value Functions and Graphs	**9.2.3.1** Evaluate polynomial and rational expressions and expressions containing radicals and absolute values at specified points in their domains. **8.2.4.6** Represent relationships in various contexts with equations and inequalities involving the absolute value of a linear expression. Solve such equations and inequalities and graph the solutions on a number line.
2-8: Two Variable Inequalities	**9.2.4** Represent real-world and mathematical situations using equations and inequalities involving linear, quadratic, exponential and nth root functions. Solve equations and inequalities symbolically and graphically. Interpret solutions in the original context.
Chapter 3	
3-1: Solving Systems Using Tables and Graphs	**8.2.4.7** Represent relationships in various contexts using systems of linear equations. Solve systems of linear equations in two variables symbolically, graphically and numerically. **8.2.4.8** Understand that a system of linear equations may have no solution, one solution, or an infinite number of solutions. Relate the number of solutions to pairs of lines that are intersecting, parallel or identical. Check whether a pair of numbers satisfies a system of two linear equations in two unknowns by substituting the numbers into both equations.
3-2: Solving Systems Algebraically	**8.2.4.7** Represent relationships in various contexts using systems of linear equations. Solve systems of linear equations in two variables symbolically, graphically and numerically. **8.2.4.8** Understand that a system of linear equations may have no solution, one solution, or an infinite number of solutions. Relate the number of solutions to pairs of lines that are intersecting, parallel or identical. Check whether a pair of numbers satisfies a system of two linear equations in two unknowns by substituting the numbers into both equations.

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3-3: Systems of Inequalities	**9.2.4.4** Represent relationships in various contexts using systems of linear inequalities; solve them graphically. Indicate which parts of the boundary are included in and excluded from the solution set using solid and dotted lines.
3-4: Linear Programming	**9.2.4.4** Represent relationships in various contexts using systems of linear inequalities; solve them graphically. Indicate which parts of the boundary are included in and excluded from the solution set using solid and dotted lines. **9.2.4.5** Solve linear programming problems in two variables using graphical methods.
3-5: Systems With Three Variables	The Minnesota standards do not refer to systems with three variables.
3-6: Solving Systems Using Matrices	The Minnesota standards do not refer to solving systems using matrices.
Chapter 4	
4-1: Quadratic Functions and Transformations	**9.2.1.5** Identify the vertex, line of symmetry and intercepts of the parabola corresponding to a quadratic function, using symbolic and graphical methods, when the function is expressed in the form $f(x) = ax^2 + bx + c$, in the form $f(x) = a(x – h)^2 + k$, or in factored form. **9.2.1.9** Determine how translations affect the symbolic and graphical forms of a function. Know how to use graphing technology to examine translations. **9.2.2.1** Represent and solve problems in various contexts using linear and quadratic functions. **9.2.2.3** Sketch graphs of linear, quadratic and exponential functions, and translate between graphs, tables and symbolic representations. Know how to use graphing technology to graph these functions.

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(Continued) 4-1: Quadratic Functions and Transformations	**9.2.4.1** Represent relationships in various contexts using quadratic equations and inequalities. Solve quadratic equations and inequalities by appropriate methods including factoring, completing the square, graphing and the quadratic formula. Find non-real complex roots when they exist. Recognize that a particular solution may not be applicable in the original context. Know how to use calculators, graphing utilities or other technology to solve quadratic equations and inequalities.
4-2: Standard Form of a Quadratic Function	**9.2.1.5** Identify the vertex, line of symmetry and intercepts of the parabola corresponding to a quadratic function, using symbolic and graphical methods, when the function is expressed in the form $f(x) = ax^2 + bx + c$, in the form $f(x) = a(x – h)^2 + k$, or in factored form.
4-3: Modeling With Quadratic Functions	**9.2.2.1** Represent and solve problems in various contexts using linear and quadratic functions. **9.2.4.1** Represent relationships in various contexts using quadratic equations and inequalities. Solve quadratic equations and inequalities by appropriate methods including factoring, completing the square, graphing and the quadratic formula. Find non-real complex roots when they exist. Recognize that a particular solution may not be applicable in the original context. Know how to use calculators, graphing utilities or other technology to solve quadratic equations and inequalities.
4-4: Factoring Quadratic Expressions	**9.2.4.1** Represent relationships in various contexts using quadratic equations and inequalities. Solve quadratic equations and inequalities by appropriate methods including factoring, completing the square, graphing and the quadratic formula. Find non-real complex roots when they exist. Recognize that a particular solution may not be applicable in the original context. Know how to use calculators, graphing utilities or other technology to solve quadratic equations and inequalities.

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4-5: Quadratic Equations	**9.2.4.1** Represent relationships in various contexts using quadratic equations and inequalities. Solve quadratic equations and inequalities by appropriate methods including factoring, completing the square, graphing and the quadratic formula. Find non-real complex roots when they exist. Recognize that a particular solution may not be applicable in the original context. Know how to use calculators, graphing utilities or other technology to solve quadratic equations and inequalities. **9.2.4.3** Recognize that to solve certain equations, number systems need to be extended from whole numbers to integers, from integers to rational numbers, from rational numbers to real numbers, and from real numbers to complex numbers. In particular, non-real complex numbers are needed to solve some quadratic equations with real coefficients.
4-6: Completing the Square	**9.2.4.1** Represent relationships in various contexts using quadratic equations and inequalities. Solve quadratic equations and inequalities by appropriate methods including factoring, completing the square, graphing and the quadratic formula. Find non-real complex roots when they exist. Recognize that a particular solution may not be applicable in the original context. Know how to use calculators, graphing utilities or other technology to solve quadratic equations and inequalities.
4-7: The Quadratic Formula	**9.2.4.1** Represent relationships in various contexts using quadratic equations and inequalities. Solve quadratic equations and inequalities by appropriate methods including factoring, completing the square, graphing and the quadratic formula. Find non-real complex roots when they exist. Recognize that a particular solution may not be applicable in the original context. Know how to use calculators, graphing utilities or other technology to solve quadratic equations and inequalities.

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(Continued) 4-7: The Quadratic Formula	**9.2.4.3** Recognize that to solve certain equations, number systems need to be extended from whole numbers to integers, from integers to rational numbers, from rational numbers to real numbers, and from real numbers to complex numbers. In particular, non-real complex numbers are needed to solve some quadratic equations with real coefficients.
4-8: Complex Numbers	**9.2.3.5** Check whether a given complex number is a solution of a quadratic equation by substituting it for the variable and evaluating the expression, using arithmetic with complex numbers. **9.2.4.1** Represent relationships in various contexts using quadratic equations and inequalities. Solve quadratic equations and inequalities by appropriate methods including factoring, completing the square, graphing and the quadratic formula. Find non-real complex roots when they exist. Recognize that a particular solution may not be applicable in the original context. Know how to use calculators, graphing utilities or other technology to solve quadratic equations and inequalities. **9.2.4.3** Recognize that to solve certain equations, number systems need to be extended from whole numbers to integers, from integers to rational numbers, from rational numbers to real numbers, and from real numbers to complex numbers. In particular, non-real complex numbers are needed to solve some quadratic equations with real coefficients.
4-9: Quadratic Systems	The Minnesota standards do not refer specifically to quadratic systems.
Chapter 5	
5-1: Polynomial Functions	The Minnesota standards do not refer specifically to polynomial functions. **9.2.3.1** Evaluate polynomial and rational expressions and expressions containing radicals and absolute values at specified points in their domains.

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5-2: Polynomials, Linear Factors, and Zeros	**9.2.1.6** Identify intercepts, zeros, maxima, minima and intervals of increase and decrease from the graph of a function. **9.2.3.3** Factor common monomial factors from polynomials, factor quadratic polynomials, and factor the difference of two squares.
5-3: Solving Polynomial Equations	The Minnesota standards do not refer specifically to solving polynomial equations (other than quadratic equations). **9.2.4.1** Represent relationships in various contexts using quadratic equations and inequalities. Solve quadratic equations and inequalities by appropriate methods including factoring, completing the square, graphing and the quadratic formula. Find non-real complex roots when they exist. Recognize that a particular solution may not be applicable in the original context. Know how to use calculators, graphing utilities or other technology to solve quadratic equations and inequalities.
5-4: Dividing Polynomials	**9.2.3.2** Add, subtract and multiply polynomials; divide a polynomial by a polynomial of equal or lower degree.
5-5: Theorems About Roots of Polynomial Equations	The Minnesota standards do not refer to theorems about roots of polynomial equations.
5-6: The Fundamental Theorem of Algebra	The Minnesota standards do not refer to the Fundamental Theorem of Algebra.
5-7: The Binomial Theorem	The Minnesota standards do not refer to the Binomial Theorem.

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5-8: Polynomial Models in the Real World	The Minnesota standards do not refer specifically to polynomial models in the real world (other than linear and quadratic models). **9.2.2.1** Represent and solve problems in various contexts using linear and quadratic functions. **9.2.4.1** Represent relationships in various contexts using quadratic equations and inequalities. Solve quadratic equations and inequalities by appropriate methods including factoring, completing the square, graphing and the quadratic formula. Find non-real complex roots when they exist. Recognize that a particular solution may not be applicable in the original context. Know how to use calculators, graphing utilities or other technology to solve quadratic equations and inequalities.
5-9: Transforming Polynomial Functions	The Minnesota standards do not refer to transforming polynomial functions (other than quadratic functions). **9.2.1.5** Identify the vertex, line of symmetry and intercepts of the parabola corresponding to a quadratic function, using symbolic and graphical methods, when the function is expressed in the form $f(x) = ax^2 + bx + c$, in the form $f(x) = a(x – h)^2 + k$, or in factored form. **9.2.1.9** Determine how translations affect the symbolic and graphical forms of a function. Know how to use graphing technology to examine translations.

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Chapter 6	
6-1: Roots and Radical Expressions	**9.2.3.1** Evaluate polynomial and rational expressions and expressions containing radicals and absolute values at specified points in their domains. **9.2.3.6** Apply the properties of positive and negative rational exponents to generate equivalent algebraic expressions, including those involving nth roots. **8.2.3.1** Evaluate algebraic expressions, including expressions containing radicals and absolute values, at specified values of their variables.
6-2: Multiplying and Dividing Radical Expressions	**9.2.3** Generate equivalent algebraic expressions involving polynomials and radicals; use algebraic properties to evaluate expressions. **9.2.3.6** Apply the properties of positive and negative rational exponents to generate equivalent algebraic expressions, including those involving nth roots. For example: $\sqrt{2} \times \sqrt{7} = 2^{1/2} \times 7^{1/2} = 14^{1/2} = \sqrt{14}$. Rules for computing directly with radicals may also be used: $3\sqrt{2} \times 3\sqrt{x} = 3\sqrt{2x}$.
6-3: Binomial Radical Expressions	The Minnesota standards do not refer to binomial radical expressions.
6-4: Rational Exponents	**9.2.3.6** Apply the properties of positive and negative rational exponents to generate equivalent algebraic expressions, including those involving nth roots. For example: $\sqrt{2} \times \sqrt{7} = 2^{1/2} \times 7^{1/2} = 14^{1/2} = \sqrt{14}$. Rules for computing directly with radicals may also be used: $3\sqrt{2} \times 3\sqrt{x} = 3\sqrt{2x}$.
6-5 Solving Square Root and Other Radical Equations	**9.2.4.7** Solve equations that contain radical expressions. Recognize that extraneous solutions may arise when using symbolic methods.

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6-6: Function Operations	The Minnesota standards do not refer specifically to function operations. **9.2.3.2** Add, subtract and multiply polynomials; divide a polynomial by a polynomial of equal or lower degree. **9.2.3.4** Add, subtract, multiply, divide and simplify algebraic fractions.
6-7: Inverse Relations and Functions	The Minnesota standards do not refer to inverse relations and functions.
6-8 Graphing Radical Functions	The Minnesota standards do not refer specifically to graphing radical functions.
Chapter 7	
7-1: Exploring Exponential Models	**9.2.1.7** Understand the concept of an asymptote and identify asymptotes for exponential functions and reciprocals of linear functions, using symbolic and graphical methods. **9.2.2.2** Represent and solve problems in various contexts using exponential functions, such as investment growth, depreciation and population growth. **9.2.2.3** Sketch graphs of linear, quadratic and exponential functions, and translate between graphs, tables and symbolic representations. Know how to use graphing technology to graph these functions. **9.2.4.2** Represent relationships in various contexts using equations involving exponential functions; solve these equations graphically or numerically. Know how to use calculators, graphing utilities or other technology to solve these equations.
7-2: Properties of Exponential Functions	**9.2.1.7** Understand the concept of an asymptote and identify asymptotes for exponential functions and reciprocals of linear functions, using symbolic and graphical methods.

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(Continued) 7-2: Properties of Exponential Functions	**9.2.2.2** Represent and solve problems in various contexts using exponential functions, such as investment growth, depreciation and population growth. **9.2.2.3** Sketch graphs of linear, quadratic and exponential functions, and translate between graphs, tables and symbolic representations. Know how to use graphing technology to graph these functions. **9.2.4.2** Represent relationships in various contexts using equations involving exponential functions; solve these equations graphically or numerically. Know how to use calculators, graphing utilities or other technology to solve these equations.
7-3: Logarithmic Functions as Inverses	The Minnesota standards do not refer to logarithmic functions.
7-4: Properties of Logarithms	The Minnesota standards do not refer to logarithms.
7-5: Exponential and Logarithmic Equations	The Minnesota standards do not refer to logarithmic equations. **9.2.4.2** Represent relationships in various contexts using equations involving exponential functions; solve these equations graphically or numerically. Know how to use calculators, graphing utilities or other technology to solve these equations.
7-6: Natural Logarithms	The Minnesota standards do not refer to natural logarithms.
Chapter 8	
8-1: Inverse Variation	**7.2.1.1** Understand that a relationship between two variables, x and y, is proportional if it can be expressed in the form y/x = k or y = kx. Distinguish proportional relationships from other relationships, including inversely proportional relationships (xy = k or y = k/x).
8-2: The Reciprocal Function Family	The Minnesota standards do not refer to the reciprocal function family f(x) = 1/x.
8-3: Rational Functions and Their Graphs	The Minnesota standards do not refer to rational functions and their graphs.

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8-4: Rational Expressions	**9.2.3.1** Evaluate polynomial and rational expressions and expressions containing radicals and absolute values at specified points in their domains.
8-5: Adding and Subtracting Rational Expressions	The Minnesota standards do not refer specifically to adding and subtracting rational expressions.
8-6: Solving Rational Equations	The Minnesota standards do not refer to solving rational equations.
Chapter 9	
9-1: Mathematical Patterns	**2.2.1.1** Identify, create and describe simple number patterns involving repeated addition or subtraction, skip counting and arrays of objects such as counters or tiles. Use patterns to solve problems in various contexts. **1.2.1.1** Create simple patterns using objects, pictures, numbers and rules. Identify possible rules to complete or extend patterns. Patterns may be repeating, growing or shrinking. Calculators can be used to create and explore patterns.
9-2: Arithmetic Sequences	**8.2.1.4** Understand that an arithmetic sequence is a linear function that can be expressed in the form f (x) = mx + b, where x = 0, 1, 2, 3,… **8.2.2.4** Represent arithmetic sequences using equations, tables, graphs and verbal descriptions, and use them to solve problems.
9-3: Geometric Sequences	**9.2.2.4** Express the terms in a geometric sequence recursively and by giving an explicit (closed form) formula, and express the partial sums of a geometric series recursively.

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(Continued) 9-3: Geometric Sequences	**9.2.2.5** Recognize and solve problems that can be modeled using finite geometric sequences and series, such as home mortgage and other compound interest examples. Know how to use spreadsheets and calculators to explore geometric sequences and series in various contexts. **8.2.1.5** Understand that a geometric sequence is a non-linear function that can be expressed in the form f (x) = ab x, where x = 0, 1, 2, 3,…. **8.2.2.5** Represent geometric sequences using equations, tables, graphs and verbal descriptions, and use them to solve problems.
9-4: Arithmetic Series	The Minnesota standards do not refer specifically to arithmetic series.
9-5: Geometric Series	**9.2.2.4** Express the terms in a geometric sequence recursively and by giving an explicit (closed form) formula, and express the partial sums of a geometric series recursively. **9.2.2.5** Recognize and solve problems that can be modeled using finite geometric sequences and series, such as home mortgage and other compound interest examples. Know how to use spreadsheets and calculators to explore geometric sequences and series in various contexts.
Chapter 10	
10-1: Exploring Conic Sections	The Minnesota standards do not refer specifically to conic sections (other than parabolas and circles). **9.2.1.5** Identify the vertex, line of symmetry and intercepts of the parabola corresponding to a quadratic function, using symbolic and graphical methods, when the function is expressed in the form $f(x) = ax^2 + bx + c$, in the form $f(x) = a(x – h)^2 + k$, or in factored form.

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(Continued) 10-1: Exploring Conic Sections	**9.2.1.9** Determine how translations affect the symbolic and graphical forms of a function. Know how to use graphing technology to examine translations. **9.2.2.3** Sketch graphs of linear, quadratic and exponential functions, and translate between graphs, tables and symbolic representations. Know how to use graphing technology to graph these functions. **9.3.4.5** Know the equation for the graph of a circle with radius r and center (h, k), $(x – h)^2 + (y – k)^2 = r^2$, and justify this equation using the Pythagorean Theorem and properties of translations.
10-2: Parabolas	**9.2.1.5** Identify the vertex, line of symmetry and intercepts of the parabola corresponding to a quadratic function, using symbolic and graphical methods, when the function is expressed in the form $f(x) = ax^2 + bx + c$, in the form $f(x) = a(x – h)^2 + k$, or in factored form. **9.2.1.9** Determine how translations affect the symbolic and graphical forms of a function. Know how to use graphing technology to examine translations. **9.2.2.3** Sketch graphs of linear, quadratic and exponential functions, and translate between graphs, tables and symbolic representations. Know how to use graphing technology to graph these functions.
10-3: Circles	**9.3.4.5** Know the equation for the graph of a circle with radius r and center (h, k), $(x – h)^2 + (y – k)^2 = r^2$, and justify this equation using the Pythagorean Theorem and properties of translations.

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10-4: Ellipses	The Minnesota standards do not refer to ellipses.
10-5: Hyperbolas	The Minnesota standards do not refer to hyperbolas.
10-6: Translating Conic Sections	The Minnesota standards do not refer specifically to translating conic sections (other than parabolas and circles). **9.2.1.5** Identify the vertex, line of symmetry and intercepts of the parabola corresponding to a quadratic function, using symbolic and graphical methods, when the function is expressed in the form $f(x) = ax^2 + bx + c$, in the form $f(x) = a(x – h)^2 + k$, or in factored form. **9.2.1.9** Determine how translations affect the symbolic and graphical forms of a function. Know how to use graphing technology to examine translations. **9.3.4.5** Know the equation for the graph of a circle with radius r and center (h, k), $(x – h)^2 + (y – k)^2 = r^2$, and justify this equation using the Pythagorean Theorem and properties of translations.
Chapter 11	
11-1: Permutations and Combinations	The Minnesota standards do not refer specifically to permutations and combinations. **9.4.3.1** Select and apply counting procedures, such as the multiplication and addition principles and tree diagrams, to determine the size of a sample space (the number of possible outcomes) and to calculate probabilities.
11-2: Probability	**9.4.3.1** Select and apply counting procedures, such as the multiplication and addition principles and tree diagrams, to determine the size of a sample space (the number of possible outcomes) and to calculate probabilities.

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(Continued) 11-2: Probability	**9.4.3.2** Calculate experimental probabilities by performing simulations or experiments involving a probability model and using relative frequencies of outcomes. **9.4.3.3** Understand that the Law of Large Numbers expresses a relationship between the probabilities in a probability model and the experimental probabilities found by performing simulations or experiments involving the model. **9.4.3.4** Use random numbers generated by a calculator or a spreadsheet, or taken from a table, to perform probability simulations and to introduce fairness into decision making. **9.4.3.8** Apply probability concepts to real-world situations to make informed decisions. **7.4.3.1** Use random numbers generated by a calculator or a spreadsheet or taken from a table to simulate situations involving randomness, make a histogram to display the results, and compare the results to known probabilities. **7.4.3.2** Calculate probability as a fraction of sample space or as a fraction of area. Express probabilities as percents, decimals and fractions. **7.4.3.3** Use proportional reasoning to draw conclusions about and predict relative frequencies of outcomes based on probabilities. **6.4.1.1** Determine the sample space (set of possible outcomes) for a given experiment and determine which members of the sample space are related to certain events. Sample space may be determined by the use of tree diagrams, tables or pictorial representations.

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(Continued) 11-2: Probability	**6.4.1.2** Determine the probability of an event using the ratio between the size of the event and the size of the sample space; represent probabilities as percents, fractions and decimals between 0 and 1 inclusive. Understand that probabilities measure likelihood. **6.4.1.3** Perform experiments for situations in which the probabilities are known, compare the resulting relative frequencies with the known probabilities; know that there may be differences. **6.4.1.4** Calculate experimental probabilities from experiments; represent them as percents, fractions and decimals between 0 and 1 inclusive. Use experimental probabilities to make predictions when actual probabilities are unknown.
11-3: Probability of Multiple Events	**9.4.3.5** Apply probability concepts such as intersections, unions and complements of events, and conditional probability and independence, to calculate probabilities and solve problems. **9.4.3.6** Describe the concepts of intersections, unions and complements using Venn diagrams. Understand the relationships between these concepts and the words AND, OR, NOT, as used in computerized searches and spreadsheets. **9.4.3.7** Understand and use simple probability formulas involving intersections, unions and complements of events.
11-4: Conditional Probability	**9.4.3.9** Use the relationship between conditional probabilities and relative frequencies in contingency tables.

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11-5: Probability Models	**9.4.3.2** Calculate experimental probabilities by performing simulations or experiments involving a probability model and using relative frequencies of outcomes. **9.4.3.3** Understand that the Law of Large Numbers expresses a relationship between the probabilities in a probability model and the experimental probabilities found by performing simulations or experiments involving the model. **9.4.3.4** Use random numbers generated by a calculator or a spreadsheet, or taken from a table, to perform probability simulations and to introduce fairness into decision making. **9.4.3.8** Apply probability concepts to real-world situations to make informed decisions. **7.4.3.1** Use random numbers generated by a calculator or a spreadsheet or taken from a table to simulate situations involving randomness, make a histogram to display the results, and compare the results to known probabilities.
11-6: Analyzing Data	**9.4.1.1** Describe a data set using data displays, including box-and-whisker plots; describe and compare data sets using summary statistics, including measures of center, location and spread. Measures of center and location include mean, median, quartile and percentile. Measures of spread include standard deviation, range and inter-quartile range. Know how to use calculators, spreadsheets or other technology to display data and calculate summary statistics. **9.4.1.2** Analyze the effects on summary statistics of changes in data sets.

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(Continued) 11-6: Analyzing Data	**9.4.2.1** Evaluate reports based on data published in the media by identifying the source of the data, the design of the study, and the way the data are analyzed and displayed. Show how graphs and data can be distorted to support different points of view. Know how to use spreadsheet tables and graphs or graphing technology to recognize and analyze distortions in data displays. **9.4.2.2** Identify and explain misleading uses of data; recognize when arguments based on data confuse correlation and causation.
11-7: Standard Deviation	**9.4.1.1** Describe a data set using data displays, including box-and-whisker plots; describe and compare data sets using summary statistics, including measures of center, location and spread. Measures of center and location include mean, median, quartile and percentile. Measures of spread include standard deviation, range and inter-quartile range. Know how to use calculators, spreadsheets or other technology to display data and calculate summary statistics. **9.4.1.2** Analyze the effects on summary statistics of changes in data sets.
11-8 Samples and Surveys	**9.4.2.3** Design simple experiments and explain the impact of sampling methods, bias and the phrasing of questions asked during data collection.
11-9: Binomial Distributions	The Minnesota standards do not refer to binomial distributions.
11-10: Normal Distributions	**9.4.1.4** Use the mean and standard deviation of a data set to fit it to a normal distribution (bell-shaped curve) and to estimate population percentages. Recognize that there are data sets for which such a procedure is not appropriate. Use calculators, spreadsheets and tables to estimate areas under the normal curve.

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Chapter 12	
12-1: Adding and Subtracting Matrices	The Minnesota standards do not refer to adding and subtracting matrices.
12-2: Matrix Multiplication	The Minnesota standards do not refer to matrix multiplication.
12-3: Determinants and Inverses	The Minnesota standards do not refer to determinants and inverses.
12-4: Inverse Matrices and Systems	The Minnesota standards do not refer to inverse matrices and systems.
12-5: Geometric Transformations	**9.3.4.6** Use numeric, graphic and symbolic representations of transformations in two dimensions, such as reflections, translations, scale changes and rotations about the origin by multiples of 90°, to solve problems involving figures on a coordinate grid. **7.3.2.4** Graph and describe translations and reflections of figures on a coordinate grid and determine the coordinates of the vertices of the figure after the transformation. **4.3.3.1** Apply translations (slides) to figures. **4.3.3.2** Apply reflections (flips) to figures by reflecting over vertical or horizontal lines and relate reflections to lines of symmetry. **4.3.3.3** Apply rotations (turns) of 90° clockwise or counterclockwise. **4.3.3.4** Recognize that translations, reflections and rotations preserve congruency and use them to show that two figures are congruent.
12-6: Vectors	The Minnesota standards do not refer to vectors.
Chapter 13	
13-1: Exploring Periodic Data	The Minnesota standards do not refer to periodic data.

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13-2: Angles and the Unit Circle	The Minnesota standards do not refer specifically to the unit circle. **9.3.3.5** Know and apply properties of right triangles, including properties of 45-45-90 and 30-60-90 triangles, to solve problems and logically justify results.
13-3: Radian Measure	The Minnesota standards do not refer to vectors.
13-4: The Sine Function	The Minnesota standards refer to right triangle trigonometry (not circular functions). **9.3.4.1** Understand how the properties of similar right triangles allow the trigonometric ratios to be defined, and determine the sine, cosine and tangent of an acute angle in a right triangle. **9.3.4.2** Apply the trigonometric ratios sine, cosine and tangent to solve problems, such as determining lengths and areas in right triangles and in figures that can be decomposed into right triangles. Know how to use calculators, tables or other technology to evaluate trigonometric ratios.
13-5: The Cosine Function	The Minnesota standards refer to right triangle trigonometry (not circular functions). **9.3.4.1** Understand how the properties of similar right triangles allow the trigonometric ratios to be defined, and determine the sine, cosine and tangent of an acute angle in a right triangle. **9.3.4.2** Apply the trigonometric ratios sine, cosine and tangent to solve problems, such as determining lengths and areas in right triangles and in figures that can be decomposed into right triangles. Know how to use calculators, tables or other technology to evaluate trigonometric ratios.

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13-6: The Tangent Function	The Minnesota standards refer to right triangle trigonometry (not circular functions). **9.3.4.1** Understand how the properties of similar right triangles allow the trigonometric ratios to be defined, and determine the sine, cosine and tangent of an acute angle in a right triangle. **9.3.4.2** Apply the trigonometric ratios sine, cosine and tangent to solve problems, such as determining lengths and areas in right triangles and in figures that can be decomposed into right triangles. Know how to use calculators, tables or other technology to evaluate trigonometric ratios.
13-7: Translating Sine and Cosine Functions	The Minnesota standards do not refer to properties of the graphs of the sine and cosine functions.
13-8: Reciprocal Trigonometric Functions	The Minnesota standards do not refer to reciprocal trigonometric functions.
Chapter 14	
14-1: Trigonometric Identities	The Minnesota standards do not refer to trigonometric identities.
14-2: Solving Trigonometric Equations Using Inverses	The Minnesota standards do not refer specifically to solving trigonometric equations. **9.3.4.3** Use calculators, tables or other technologies in connection with the trigonometric ratios to find angle measures in right triangles in various contexts.
14-3: Right Triangles and Trigonometric Ratios	**9.3.4.1** Understand how the properties of similar right triangles allow the trigonometric ratios to be defined, and determine the sine, cosine and tangent of an acute angle in a right triangle. **9.3.4.2** Apply the trigonometric ratios sine, cosine and tangent to solve problems, such as determining lengths and areas in right triangles and in figures that can be decomposed into right triangles. Know how to use calculators, tables or other technology to evaluate trigonometric ratios.

Pearson High School Mathematics Common Core Algebra 2, ©2015	**Minnesota Mathematics K-12 Academic Standards**
(Continued) 14-3: Right Triangles and Trigonometric Ratios	**9.3.4.3** Use calculators, tables or other technologies in connection with the trigonometric ratios to find angle measures in right triangles in various contexts.
14-4: Area and the Law of Sines	The Minnesota standards do not refer to the Law of Sines. **9.3.4.2** Apply the trigonometric ratios sine, cosine and tangent to solve problems, such as determining lengths and areas in right triangles and in figures that can be decomposed into right triangles. Know how to use calculators, tables or other technology to evaluate trigonometric ratios. For example: Find the area of a triangle, given the measure of one of its acute angles and the lengths of the two sides that form that angle.
14-5: The Law of Cosines	The Minnesota standards do not refer to the Law of Cosines.
14-6: Angle Identities	The Minnesota standards do not refer to angle identities.
14-7: Double-Angle and Half-Angle Identities	The Minnesota standards do not refer to double-angle and half-angle identities.