

An Alignment of
**Minnesota Academic Standards
for Mathematics 2007**



To the Lessons of
**Pearson High School Mathematics
Algebra 1 Common Core**



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Chapter 1	
1-1: Variables and Expressions	<p>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.</p> <p>7.2.2.4 Represent real-world or mathematical situations using equations and inequalities involving variables and positive and negative rational numbers.</p> <p>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.</p> <p>6.2.1.1 Understand that a variable can be used to represent a quantity that can change, often in relationship to another changing quantity. Use variables in various contexts.</p> <p>6.2.3.1 Represent real-world or mathematical situations using equations and inequalities involving variables and positive rational numbers.</p> <p>5.2.3.2 Represent real-world situations using equations and inequalities involving variables. Create real-world situations corresponding to equations and inequalities.</p>

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<p>1-2: Order of Operations and Evaluating Expressions</p>	<p>8.2.3.1 Evaluate algebraic expressions, including expressions containing radicals and absolute values, at specified values of their variables.</p> <p>7.2.3.2 Evaluate algebraic expressions containing rational numbers and whole number exponents at specified values of their variables.</p> <p>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.</p> <p>5.2.3.3 Evaluate expressions and solve equations involving variables when values for the variables are given.</p>
<p>1-3: Real Numbers and the Number Line</p>	<p>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.</p> <p>8.1.1.2 Compare real numbers; locate real numbers on a number line. Identify the square root of a positive integer as an integer, or if it is not an integer, locate it as a real number between two consecutive positive integers.</p>
<p>1-4: Properties of Real Numbers</p>	<p>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.</p>

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<p>(Continued) 1-4: Properties of Real Numbers</p>	<p>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.</p> <p>8.1.1 Read, write, compare, classify and represent real numbers, and use them to solve problems in various contexts.</p> <p>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.</p> <p>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.</p> <p>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.</p> <p>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.</p>

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1-5: Adding and Subtracting Real Numbers	<p>7.1.2.1 Add, subtract, multiply and divide positive and negative rational numbers that are integers, fractions and terminating decimals; use efficient and generalizable procedures, including standard algorithms; raise positive rational numbers to whole-number exponents.</p> <p>7.1.2.2 Use real-world contexts and the inverse relationship between addition and subtraction to explain why the procedures of arithmetic with negative rational numbers make sense.</p> <p>5.1.1.4 Solve real-world and mathematical problems requiring addition, subtraction, multiplication and division of multi-digit whole numbers. Use various strategies, including the inverse relationships between operations, the use of technology, and the context of the problem to assess the reasonableness of results.</p> <p>5.1.3.1 Add and subtract decimals and fractions, using efficient and generalizable procedures, including standard algorithms.</p> <p>5.1.3.2 Model addition and subtraction of fractions and decimals using a variety of representations.</p> <p>5.1.3.4 Solve real-world and mathematical problems requiring addition and subtraction of decimals, fractions and mixed numbers, including those involving measurement, geometry and data.</p>

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<p>(Continued) 1-5: Adding and Subtracting Real Numbers</p>	<p>4.1.1.5 Solve multi-step real-world and mathematical problems requiring the use of addition, subtraction and multiplication of multi-digit whole numbers. Use various strategies, including the relationship between operations, the use of technology, and the context of the problem to assess the reasonableness of results.</p> <p>3.1.2.1 Add and subtract multi-digit numbers, using efficient and generalizable procedures based on knowledge of place value, including standard algorithms.</p> <p>2.1.2.5 Solve real-world and mathematical addition and subtraction problems involving whole numbers with up to 2 digits.</p>
<p>1-6: Multiplying and Dividing Real Numbers</p>	<p>8.1.1.5 Express approximations of very large and very small numbers using scientific notation; understand how calculators display numbers in scientific notation. Multiply and divide numbers expressed in scientific notation, express the answer in scientific notation, using the correct number of significant digits when physical measurements are involved.</p> <p>7.1.2.1 Add, subtract, multiply and divide positive and negative rational numbers that are integers, fractions and terminating decimals; use efficient and generalizable procedures, including standard algorithms; raise positive rational numbers to whole-number exponents.</p> <p>6.1.3.1 Multiply and divide decimals and fractions, using efficient and generalizable procedures, including standard algorithms.</p> <p>6.1.3.2 Use the meanings of fractions, multiplication, division and the inverse relationship between multiplication and division to make sense of procedures for multiplying and dividing fractions.</p>

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<p>(Continued) 1-6: Multiplying and Dividing Real Numbers</p>	<p>5.1.1.4 Solve real-world and mathematical problems requiring addition, subtraction, multiplication and division of multi-digit whole numbers. Use various strategies, including the inverse relationships between operations, the use of technology, and the context of the problem to assess the reasonableness of results.</p> <p>4.1.1.1 Demonstrate fluency with multiplication and division facts.</p> <p>4.1.1.2 Use an understanding of place value to multiply a number by 10, 100 and 1000.</p> <p>4.1.1.3 Multiply multi-digit numbers, using efficient and generalizable procedures, based on knowledge of place value, including standard algorithms.</p> <p>4.1.1.5 Solve multi-step real-world and mathematical problems requiring the use of addition, subtraction and multiplication of multi-digit whole numbers. Use various strategies, including the relationship between operations, the use of technology, and the context of the problem to assess the reasonableness of results.</p>
<p>1-7: The Distributive Property</p>	<p>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.</p> <p>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.</p>

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<p>(Continued) 1-7: The Distributive Property</p>	<p>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.</p> <p>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.</p> <p>4.1.1.6 Use strategies and algorithms based on knowledge of place value, equality and properties of operations to divide multi-digit whole numbers by one- or two-digit numbers. Strategies may include mental strategies, partial quotients, the commutative, associative, and distributive properties and repeated subtraction.</p> <p>3.1.2.5 Use strategies and algorithms based on knowledge of place value, equality and properties of addition and multiplication to multiply a two- or three-digit number by a one-digit number. Strategies may include mental strategies, partial products, the standard algorithm, and the commutative, associative, and distributive properties.</p>
<p>1-8: An Introduction to Equations</p>	<p>8.2.2.1 Represent linear functions with tables, verbal descriptions, symbols, equations and graphs; translate from one representation to another.</p> <p>8.2.4.1 Use linear equations to represent situations involving a constant rate of change, including proportional and non-proportional relationships.</p>

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<p>(Continued) 1-8: An Introduction to Equations</p>	<p>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.</p> <p>7.2.2.4 Represent real-world or mathematical situations using equations and inequalities involving variables and positive and negative rational numbers.</p> <p>7.2.4.2 Solve equations resulting from proportional relationships in various contexts.</p> <p>6.2.3.1 Represent real-world or mathematical situations using equations and inequalities involving variables and positive rational numbers.</p> <p>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.</p> <p>5.2.3.1 Determine whether an equation or inequality involving a variable is true or false for a given value of the variable.</p> <p>5.2.3.2 Represent real-world situations using equations and inequalities involving variables. Create real-world situations corresponding to equations and inequalities.</p> <p>5.2.3.3 Evaluate expressions and solve equations involving variables when values for the variables are given.</p>

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<p>1-9: Patterns, Equations, and Graphs</p>	<p>8.2.2.1 Represent linear functions with tables, verbal descriptions, symbols, equations and graphs; translate from one representation to another.</p> <p>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.</p> <p>6.2.1.2 Represent the relationship between two varying quantities with function rules, graphs and tables; translate between any two of these representations.</p> <p>5.2.1.1 Create and use rules, tables, spreadsheets and graphs to describe patterns of change and solve problems.</p>
<p>Chapter 2</p>	
<p>2-1: Solving One-Step Equations</p>	<p>8.2.4 Represent real-world and mathematical situations using equations and inequalities involving linear expressions. Solve equations and inequalities symbolically and graphically. Interpret solutions in the original context.</p> <p>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.</p> <p>7.2.4.2 Solve equations resulting from proportional relationships in various contexts.</p>

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<p>(Continued) 2-1: Solving One-Step Equations</p>	<p>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.</p>
<p>2-2: Solving Two-Step Equations</p>	<p>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.</p> <p>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.</p> <p>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.</p>
<p>2-3: Solving Multi-Step Equations</p>	<p>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.</p> <p>7.2.2.2 Solve multi-step problems involving proportional relationships in numerous contexts.</p> <p>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.</p>

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<p>(Continued) 2-3: Solving Multi-Step Equations</p>	<p>4.1.1.5 Solve multi-step real-world and mathematical problems requiring the use of addition, subtraction and multiplication of multi-digit whole numbers. Use various strategies, including the relationship between operations, the use of technology, and the context of the problem to assess the reasonableness of results</p>
<p>2-4: Solving Equations With Variables on Both Sides</p>	<p>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.</p> <p>7.2.2.2 Solve multi-step problems involving proportional relationships in numerous contexts.</p> <p>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.</p>
<p>2-5: Literal Equations and Formulas</p>	<p>9.3.1.3 Understand that quantities associated with physical measurements must be assigned units; apply such units correctly in expressions, equations and problem solutions that involve measurements; and convert between measurement systems.</p> <p>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.</p>

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<p>(Continued) 2-5: Literal Equations and Formulas</p>	<p>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.</p> <p>7.3.1.2 Calculate the volume and surface area of cylinders and justify the formulas used.</p> <p>6.3.1.1 Calculate the surface area and volume of prisms and use appropriate units, such as cm² and cm³. Justify the formulas used. Justification may involve decomposition, nets or other models.</p> <p>5.2.3.3 Evaluate expressions and solve equations involving variables when values for the variables are given.</p> <p>5.3.2.1 Develop and use formulas to determine the area of triangles, parallelograms and figures that can be decomposed into triangles.</p>
<p>2-6: Ratios, Rates, and Conversions</p>	<p>9.3.1.3 Understand that quantities associated with physical measurements must be assigned units; apply such units correctly in expressions, equations and problem solutions that involve measurements; and convert between measurement systems.</p> <p>7.1.2.5 Use proportional reasoning to solve problems involving ratios in various contexts.</p> <p>7.3.2.3 Use proportions and ratios to solve problems involving scale drawings and conversions of measurement units.</p> <p>6.1.2.1 Identify and use ratios to compare quantities; understand that comparing quantities using ratios is not the same as comparing quantities using subtraction.</p>

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<p>(Continued) 2-6: Ratios, Rates, and Conversions</p>	<p>6.1.2.2 Apply the relationship between ratios, equivalent fractions and percents to solve problems in various contexts, including those involving mixtures and concentrations.</p> <p>6.1.2.3 Determine the rate for ratios of quantities with different units.</p> <p>6.1.2.4 Use reasoning about multiplication and division to solve ratio and rate problems.</p> <p>6.3.3.1 Solve problems in various contexts involving conversion of weights, capacities, geometric measurements and times within measurement systems using appropriate units.</p>
<p>2-7: Solving Proportions</p>	<p>9.3.3.6 Know and apply properties of congruent and similar figures to solve problems and logically justify results.</p> <p>7.1.2.5 Use proportional reasoning to solve problems involving ratios in various contexts.</p> <p>7.2.4.2 Solve equations resulting from proportional relationships in various contexts.</p> <p>7.3.2.3 Use proportions and ratios to solve problems involving scale drawings and conversions of measurement units.</p>

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<p>2-8: Proportions and Similar Figures</p>	<p>9.3.3.6 Know and apply properties of congruent and similar figures to solve problems and logically justify results.</p> <p>7.3.2.1 Describe the properties of similarity, compare geometric figures for similarity, and determine scale factors.</p> <p>7.3.2.2 Apply scale factors, length ratios and area ratios to determine side lengths and areas of similar geometric figures.</p>
<p>2-9: Percents</p>	<p>6.1.1.3 Understand that percent represents parts out of 100 and ratios to 100.</p> <p>6.1.1.4 Determine equivalences among fractions, decimals and percents; select among these representations to solve problems.</p> <p>6.1.2.2 Apply the relationship between ratios, equivalent fractions and percents to solve problems in various contexts, including those involving mixtures and concentrations.</p> <p>6.1.3.3 Calculate the percent of a number and determine what percent one number is of another number to solve problems in various contexts.</p>
<p>2-10: Change Expressed as a Percent</p>	<p>7.2.2.2 Solve multi-step problems involving proportional relationships in numerous contexts. For example: Distance-time, percent increase or decrease, discounts, tips, unit pricing, lengths in similar geometric figures, and unit conversion when a conversion factor is given, including conversion between different measurement systems.</p>

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Chapter 3	
3-1: Inequalities and Their Graphs	<p>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.</p> <p>8.2.4.5 Solve linear inequalities using properties of inequalities. Graph the solutions on a number line.</p>
3-2: Solving Inequalities Using Addition or Subtraction	<p>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.</p> <p>8.2.4.4 Use linear inequalities to represent relationships in various contexts.</p> <p>8.2.4.5 Solve linear inequalities using properties of inequalities. Graph the solutions on a number line.</p> <p>7.2.2.4 Represent real-world or mathematical situations using equations and inequalities involving variables and positive and negative rational numbers.</p>
3-3: Solving Inequalities Using Multiplication or Division	<p>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.</p> <p>8.2.4.4 Use linear inequalities to represent relationships in various contexts.</p>

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<p>(Continued) 3-3: Solving Inequalities Using Multiplication or Division</p>	<p>8.2.4.5 Solve linear inequalities using properties of inequalities. Graph the solutions on a number line.</p> <p>7.2.2.4 Represent real-world or mathematical situations using equations and inequalities involving variables and positive and negative rational numbers.</p>
<p>3-4: Solving Multi-Step Inequalities</p>	<p>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.</p> <p>8.2.4.4 Use linear inequalities to represent relationships in various contexts.</p> <p>8.2.4.5 Solve linear inequalities using properties of inequalities. Graph the solutions on a number line.</p> <p>7.2.2.4 Represent real-world or mathematical situations using equations and inequalities involving variables and positive and negative rational numbers.</p>
<p>3-5: Working with Sets</p>	<p>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.</p> <p>8.2.4.5 Solve linear inequalities using properties of inequalities. Graph the solutions on a number line.</p>

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<p>3-6: Compound Inequalities</p>	<p>The Minnesota standards do not refer specifically to compound inequalities.</p> <p>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.</p> <p>8.2.4.5 Solve linear inequalities using properties of inequalities. Graph the solutions on a number line.</p> <p>7.2.2.4 Represent real-world or mathematical situations using equations and inequalities involving variables and positive and negative rational numbers.</p> <p>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.</p>
<p>3-7: Absolute Value Equations and Inequalities</p>	<p>9.2.4.6 Represent relationships in various contexts using absolute value inequalities in two variables; solve them graphically.</p> <p>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.</p>
<p>3-8: Unions and Intersections of Sets</p>	<p>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.</p>

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<p>Chapter 4</p>	
<p>4-1: Using Graphs to Relate Two Quantities</p>	<p>9.2.1.4 Obtain information and draw conclusions from graphs of functions and other relations.</p>
<p>4-2: Patterns and Linear Functions</p>	<p>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.</p> <p>9.2.2.1 Represent and solve problems in various contexts using linear and quadratic functions.</p> <p>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.</p> <p>8.2.2.1 Represent linear functions with tables, verbal descriptions, symbols, equations and graphs; translate from one representation to another.</p> <p>8.2.2.4 Represent arithmetic sequences using equations, tables, graphs and verbal descriptions, and use them to solve problems.</p>
<p>4-3: Patterns and Nonlinear Functions</p>	<p>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.</p>

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<p>(Continued) 4-3: Patterns and Nonlinear Functions</p>	<p>9.2.2.1 Represent and solve problems in various contexts using linear and quadratic functions.</p> <p>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 $x = 0, 1, 2, 3, \dots$</p> <p>8.2.2.5 Represent geometric sequences using equations, tables, graphs and verbal descriptions, and use them to solve problems.</p>
<p>4-4: Graphing a Function Rule</p>	<p>9.2.1.4 Obtain information and draw conclusions from graphs of functions and other relations.</p> <p>9.2.2.6 Sketch the graphs of common non-linear functions such as $f(x) = \sqrt{x}$, $f(x) = x$, $f(x) = 1/x$, $f(x) = x^3$ and translations of these functions, such as $f(x) = \sqrt{x-2}+4$.</p> <p>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.</p> <p>8.2.2.1 Represent linear functions with tables, verbal descriptions, symbols, equations and graphs; translate from one representation to another.</p> <p>8.2.2.3 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.</p>

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<p>4-5: Writing a Function Rule</p>	<p>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.</p> <p>9.2.2.1 Represent and solve problems in various contexts using linear and quadratic functions.</p> <p>6.2.1.2 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.</p> <p>5.2.1.1 Create and use rules, tables, spreadsheets and graphs to describe patterns of change and solve problems.</p>
<p>4-6: Formalizing Relations and Functions</p>	<p>9.2.2.1 Represent and solve problems in various contexts using linear and quadratic functions.</p> <p>9.2.1.4 Obtain information and draw conclusions from graphs of functions and other relations.</p> <p>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.</p>

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<p>(Continued) 4-6: Formalizing Relations and Functions</p>	<p>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.</p> <p>6.2.1.2 Represent the relationship between two varying quantities with function rules, graphs and tables; translate between any two of these representations.</p>
<p>4-7: Arithmetic Sequences</p>	<p>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 $x = 0, 1, 2, 3, \dots$</p> <p>8.2.2.4 Represent arithmetic sequences using equations, tables, graphs and verbal descriptions, and use them to solve problems.</p>
<p>Chapter 5</p>	
<p>5-1: Rate of Change and Slope</p>	<p>9.2.1.8 Make qualitative statements about the rate of change of a function, based on its graph or table of values.</p> <p>9.3.4.4 Use coordinate geometry to represent and analyze line segments and polygons, including determining lengths, midpoints and slopes of line segments.</p> <p>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.</p> <p>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.</p>

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<p>5-2: Direct Variation</p>	<p>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.</p> <p>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.</p> <p>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.</p> <p>7.2.2.2 Solve multi-step problems involving proportional relationships in numerous contexts.</p> <p>7.2.4.2 Solve equations resulting from proportional relationships in various contexts.</p> <p>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.</p>
<p>5-3: Slope-Intercept Form</p>	<p>9.2.2.1 Represent and solve problems in various contexts using linear and quadratic functions.</p> <p>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.</p>

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<p>(Continued) 5-3: Slope-Intercept Form</p>	<p>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.</p> <p>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.</p>
<p>5-4: Point-Slope Form</p>	<p>9.2.2.1 Represent and solve problems in various contexts using linear and quadratic functions.</p> <p>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.</p>
<p>5-5: Standard Form</p>	<p>9.2.2.1 Represent and solve problems in various contexts using linear and quadratic functions.</p> <p>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.</p>
<p>5-6: Parallel and Perpendicular Lines</p>	<p>9.3.3.1 Know and apply properties of parallel and perpendicular lines, including properties of angles formed by a transversal, to solve problems and logically justify results.</p> <p>9.3.4.4 Use coordinate geometry to represent and analyze line segments and polygons, including determining lengths, midpoints and slopes of line segments.</p>

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<p>(Continued) 5-6: Parallel and Perpendicular Lines</p>	<p>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.</p> <p>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.</p>
<p>5-7: Scatter Plots and Trend Lines</p>	<p>9.4.1.3 Use scatterplots to analyze patterns and describe relationships between two variables. Using technology, determine regression lines (line of best fit) and correlation coefficients; use regression lines to make predictions and correlation coefficients to assess the reliability of those predictions.</p> <p>8.4.1.1 Collect, display and interpret data using scatterplots. Use the shape of the scatterplot to informally estimate a line of best fit and determine an equation for the line. Use appropriate titles, labels and units. Know how to use graphing technology to display scatterplots and corresponding lines of best fit.</p> <p>8.4.1.2 Use a line of best fit to make statements about approximate rate of change and to make predictions about values not in the original data set.</p> <p>8.4.1.3 Assess the reasonableness of predictions using scatterplots by interpreting them in the original context.</p>
<p>5-8: Graphing Absolute Value Functions</p>	<p>9.2.3.1 Evaluate polynomial and rational expressions and expressions containing radicals and absolute values at specified points in their domains.</p>

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<p>(Continued) 5-8: Graphing Absolute Value Functions</p>	<p>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.</p>
<p>Chapter 6</p>	
<p>6-1: Solving Systems by Graphing</p>	<p>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.</p> <p>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.</p>
<p>6-2: Solving Systems Using Substitution</p>	<p>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.</p> <p>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.</p>
<p>6-3: Solving Systems Using Elimination</p>	<p>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.</p>

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<p>(Continued) 6-3: Solving Systems Using Elimination</p>	<p>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.</p>
<p>6-4: Applications of Linear Systems</p>	<p>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.</p> <p>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.</p>
<p>6-5: Linear Inequalities</p>	<p>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.</p> <p>8.2.4.4 Use linear inequalities to represent relationships in various contexts.</p> <p>8.2.4.5 Solve linear inequalities using properties of inequalities. Graph the solutions on a number line.</p>
<p>6-6: Systems of Linear Inequalities</p>	<p>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.</p>

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(Continued) -6: Systems of Linear Inequalities	<p>9.2.4.5 Solve linear programming problems in two variables using graphical methods.</p>
Chapter 7	
7-1: Zero and Negative Exponents	<p>9.2.3.6 Apply the properties of positive and negative rational exponents to generate equivalent algebraic expressions, including those involving nth roots.</p> <p>8.1.1.4 Know and apply the properties of positive and negative integer exponents to generate equivalent numerical expressions.</p>
7-2: Multiplying Powers With the Same Base	<p>9.2.3.6 Apply the properties of positive and negative rational exponents to generate equivalent algebraic expressions, including those involving nth roots.</p> <p>8.1.1.4 Know and apply the properties of positive and negative integer exponents to generate equivalent numerical expressions.</p> <p>7.1.2.4 Solve problems in various contexts involving calculations with positive and negative rational numbers and positive integer exponents, including computing simple and compound interest.</p> <p>7.2.3.2 Evaluate algebraic expressions containing rational numbers and whole number exponents at specified values of their variables.</p>
7-3: More Multiplication Properties of Exponents	<p>9.2.3.6 Apply the properties of positive and negative rational exponents to generate equivalent algebraic expressions, including those involving nth roots.</p> <p>8.1.1.4 Know and apply the properties of positive and negative integer exponents to generate equivalent numerical expressions.</p>

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<p>(Continued) 7-3: More Multiplication Properties of Exponents</p>	<p>7.1.2.4 Solve problems in various contexts involving calculations with positive and negative rational numbers and positive integer exponents, including computing simple and compound interest.</p> <p>7.2.3.2 Evaluate algebraic expressions containing rational numbers and whole number exponents at specified values of their variables.</p>
<p>7-4: Division Properties of Exponents</p>	<p>9.2.3.6 Apply the properties of positive and negative rational exponents to generate equivalent algebraic expressions, including those involving nth roots.</p> <p>8.1.1.4 Know and apply the properties of positive and negative integer exponents to generate equivalent numerical expressions.</p> <p>7.1.2.4 Solve problems in various contexts involving calculations with positive and negative rational numbers and positive integer exponents, including computing simple and compound interest.</p> <p>7.2.3.2 Evaluate algebraic expressions containing rational numbers and whole number exponents at specified values of their variables.</p>
<p>7-5: Rational Exponents and Radicals</p>	<p>9.2.3.6 Apply the properties of positive and negative rational exponents to generate equivalent algebraic expressions, including those involving nth roots.</p>
<p>7-6: Exponential Functions</p>	<p>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.</p>

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<p>(Continued) 7-6: Exponential Functions</p>	<p>9.2.2.2 Represent and solve problems in various contexts using exponential functions, such as investment growth, depreciation and population growth.</p> <p>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.</p> <p>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.</p>
<p>7-7: Exponential Growth and Decay</p>	<p>9.2.2.2 Represent and solve problems in various contexts using exponential functions, such as investment growth, depreciation and population growth.</p> <p>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.</p>
<p>7-8: Geometric Sequence</p>	<p>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.</p> <p>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.</p>

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(Continued) 7-8: Geometric Sequence	<p>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 $x = 0, 1, 2, 3, \dots$</p> <p>8.2.2.5 Represent geometric sequences using equations, tables, graphs and verbal descriptions, and use them to solve problems.</p>
Chapter 8	
8-1: Adding and Subtracting Polynomials	9.2.3.2 Add, subtract and multiply polynomials; divide a polynomial by a polynomial of equal or lower degree.
8-2: Multiplying and Factoring	<p>9.2.3.2 Add, subtract and multiply polynomials; divide a polynomial by a polynomial of equal or lower degree.</p> <p>9.2.3.3 Factor common monomial factors from polynomials, factor quadratic polynomials, and factor the difference of two squares.</p>
8-3: Multiplying Binomials	9.2.3.2 Add, subtract and multiply polynomials; divide a polynomial by a polynomial of equal or lower degree.
8-4: Multiplying Special Cases	9.2.3.2 Add, subtract and multiply polynomials; divide a polynomial by a polynomial of equal or lower degree.
8-5: Factoring $x^2 + bx + c$	9.2.3.3 Factor common monomial factors from polynomials, factor quadratic polynomials, and factor the difference of two squares.
8-6: Factoring $ax^2 + bx + c$	9.2.3.3 Factor common monomial factors from polynomials, factor quadratic polynomials, and factor the difference of two squares.

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8-7: Factoring Special Cases	<p>9.2.3.3 Factor common monomial factors from polynomials, factor quadratic polynomials, and factor the difference of two squares.</p>
8-8: Factoring by Grouping	<p>9.2.3.3 Factor common monomial factors from polynomials, factor quadratic polynomials, and factor the difference of two squares.</p>
Chapter 9	
9-1: Quadratic Graphs and Their Properties	<p>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.</p> <p>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.</p>
9-2: Quadratic Functions	<p>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.</p> <p>9.2.2.1 Represent and solve problems in various contexts using linear and quadratic functions.</p> <p>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.</p>

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<p>(Continued) 9-2: Quadratic Functions</p>	<p>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.</p>
<p>9-3: Solving Quadratic Equations</p>	<p>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.</p> <p>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.</p>
<p>9-4: Factoring to Solve Quadratic Equations</p>	<p>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.</p>

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<p>9-5: Completing the Square</p>	<p>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.</p>
<p>9-6: The Quadratic Formula and the Discriminant</p>	<p>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.</p> <p>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.</p>
<p>9-7: Linear, Quadratic, and Exponential Models</p>	<p>9.2.2.1 Represent and solve problems in various contexts using linear and quadratic functions.</p> <p>9.2.2.2 Represent and solve problems in various contexts using exponential functions, such as investment growth, depreciation and population growth.</p>

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<p>(Continued) 9-7: Linear, Quadratic, and Exponential Models</p>	<p>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.</p> <p>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.</p> <p>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.</p>
<p>9-8: Systems of Linear and Quadratic Equations</p>	<p>The Minnesota standards refer to systems of linear equations, but not systems of quadratic equations or non-linear systems.</p> <p>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.</p> <p>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.</p>

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Chapter 10	
10-1: The Pythagorean Theorem	<p>9.3.3.4 Apply the Pythagorean Theorem and its converse to solve problems and logically justify results.</p> <p>8.3.1.1 Use the Pythagorean Theorem to solve problems involving right triangles.</p>
10-2: Simplifying Radicals	<p>9.2.3 Generate equivalent algebraic expressions involving polynomials and radicals; use algebraic properties to evaluate expressions.</p>
10-3: Operations With Radical Expressions	<p>9.2.3 Generate equivalent algebraic expressions involving polynomials and radicals; use algebraic properties to evaluate expressions.</p> <p>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: $3\sqrt{2} \times 3\sqrt{x} = 3\sqrt{2x}$.</p>
10-4: Solving Radical Equations	<p>9.2.4.7 Solve equations that contain radical expressions. Recognize that extraneous solutions may arise when using symbolic methods.</p>
10-5: Graphing Square Root Functions	The Minnesota standards do not refer specifically to graphing square root functions.
10-6: Trigonometric Ratios	<p>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.... [E]xample: Determine exact values of the trigonometric ratios in these special triangles using relationships among the side lengths.</p>

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<p>(Continued) 10-6: Trigonometric Ratios</p>	<p>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.</p> <p>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.</p> <p>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.</p>
<p>Chapter 11</p>	
<p>11-1: Simplifying Rational Expressions</p>	<p>9.2.3 Generate equivalent algebraic expressions involving polynomials and radicals; use algebraic properties to evaluate expressions.</p> <p>9.2.3.1 Evaluate polynomial and rational expressions and expressions containing radicals and absolute values at specified points in their domains.</p>
<p>11-2: Multiplying and Dividing Rational Expressions</p>	<p>The Minnesota standards do not refer specifically to multiplying and dividing rational expressions.</p>
<p>11-3: Dividing Polynomials</p>	<p>9.2.3.2 Add, subtract and multiply polynomials; divide a polynomial by a polynomial of equal or lower degree.</p>
<p>11-4: Adding and Subtracting Rational Expressions</p>	<p>The Minnesota standards do not refer specifically to adding and subtracting rational expressions.</p>
<p>11-5: Solving Rational Equations</p>	<p>The Minnesota standards do not refer to solving rational equations.</p>

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11-6: 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 $y = k/x$).
11-7: Graphing Rational Functions	The Minnesota standards do not refer to graphing rational functions.
Chapter 12	
12-1: Organizing Data Using Matrices	The Minnesota standards do not refer to organizing data using matrices.
12-2: Frequency and Histograms	7.4.2.1 Use reasoning with proportions to display and interpret data in circle graphs (pie charts) and histograms. Choose the appropriate data display and know how to create the display using a spreadsheet or other graphing technology. 3.4.1.1 Collect, display and interpret data using frequency tables, bar graphs, picture graphs and number line plots having a variety of scales. Use appropriate titles, labels and units.
12-3: Measures of Central Tendency and Dispersion	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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<p>(Continued) 12-3: Measures of Central Tendency and Dispersion</p>	<p>7.4.1.1 Design simple experiments and collect data. Determine mean, median and range for quantitative data and from data represented in a display. Use these quantities to draw conclusions about the data, compare different data sets, and make predictions.</p> <p>7.4.1.2 Describe the impact that inserting or deleting a data point has on the mean and the median of a data set. Know how to create data displays using a spreadsheet to examine this impact.</p> <p>5.4.1.1 Know and use the definitions of the mean, median and range of a set of data. Know how to use a spreadsheet to find the mean, median and range of a data set. Understand that the mean is a "leveling out" of data.</p>
<p>12-4: Box-and-Whisker Plots</p>	<p>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.</p>
<p>12-5: Samples and Surveys</p>	<p>9.4.2.3 Design simple experiments and explain the impact of sampling methods, bias and the phrasing of questions asked during data collection.</p>
<p>12-6: Permutations and Combinations</p>	<p>The Minnesota standards do not refer specifically to permutations and combinations.</p> <p>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.</p>

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<p align="center">Pearson High School Mathematics Common Core Algebra 1, ©2015</p>	<p align="center">Minnesota Mathematics K-12 Academic Standards</p>
<p>12-7: Theoretical and Experimental Probability</p>	<p>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.</p> <p>9.4.3.2 Calculate experimental probabilities by performing simulations or experiments involving a probability model and using relative frequencies of outcomes.</p> <p>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.</p> <p>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.</p> <p>9.4.3.7 Understand and use simple probability formulas involving intersections, unions and complements of events.</p> <p>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.</p> <p>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.</p>

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<p>(Continued) 12-7: Theoretical and Experimental Probability</p>	<p>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.</p>
<p>12-8: Probability of Compound Events</p>	<p>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.</p> <p>9.4.3.7 Understand and use simple probability formulas involving intersections, unions and complements of events.</p>