

Table of Contents

N.RN.1.....	1	F.IF.4.....	7	G.SRT.1b.....	13	S.CP.4.....	19
N.RN.2.....	1	F.IF.5.....	7	G.SRT.2.....	13	S.CP.5.....	19
N.RN.3.....	1	F.IF.6.....	7	G.SRT.3.....	13	S.CP.6.....	19
N.CN.1.....	1	F.IF.7a.....	7	G.SRT.4.....	13	S.CP.7.....	19
N.CN.2.....	2	F.IF.7b.....	8	G.SRT.5.....	13	S.CP.8.....	19
N.CN.7.....	2	F.IF.8a.....	8	G.SRT.6.....	14	S.CP.9.....	20
N.CN.8.....	2	F.IF.8b.....	8	G.SRT.7.....	14	S.MD.6.....	20
N.CN.9.....	2	F.IF.9.....	8	G.SRT.8.....	14	S.MD.7.....	20
A.SSE.1a.....	2	F.IF.9.....	9	G.C.1.....	15		
A.SSE.1b.....	2	F.BF.1a.....	9	G.C.2.....	15		
A.SSE.2.....	2	F.BF.1b.....	9	G.C.3.....	15		
A.SSE.3a.....	3	F.BF.3.....	9	G.C.4.....	15		
A.SSE.3b.....	3	F.BF.4.....	10	G.C.5.....	16		
A.SSE.3c.....	3	F.BF.4a.....	10	G.GPE.1.....	16		
A.APR.1.....	4	F-BF.4d.....	10	G.GPE.2.....	16		
A.APR.3.....	4	F.LE.1b.....	10	G.GPE.4.....	16		
A.CED.1.....	4	F.LE.1c.....	10	G.GPE.6.....	16		
A.CED.2.....	4	F.LE.3.....	10	G.GMD.1.....	17		
A.CED.3.....	5	F.LE.5.....	10	G.GMD.3.....	17		
A.CED.4.....	5	F.TF.8.....	10	G.MG.1.....	17		
A.REI.4.....	5	G.CO.1.....	10	G.MG.2.....	17		
A.REI.4a.....	5	G.CO.7.....	11	G.MG.3.....	17		
A.REI.B.4b.....	6	G.CO.8.....	11	S.ID.6a.....	17		
A.REI.4b.....	6	G.CO.9.....	11	S.CP.1.....	18		
A.REI.7.....	6	G.CO.10.....	12	S.CP.2.....	18		
A.REI.10.....	6	G.CO.11.....	12	S.CP.3.....	18		
A.REI.11.....	7	G.SRT.1a.....	13	S.CP.4.....	18		

Standard ID	Description	Location	Module	Topic (Textbook)/ Unit(MATHia Software)	Lesson (Textbook) / Workspace (MATHia Software)
N.RN.1	Explain how the definition of the meaning of rational exponents follows from extending the properties of integer exponents to those values, allowing for a notation for radicals in terms of rational exponents. For example, we define $5^{1/3}$ to be the cube root of 5 because we want $(5^{1/3})^3 = 5^{(1/3)3}$ to hold, so $(5^{1/3})^3$ must equal 5.	Textbook	3: Exploring Functions	2: Exponentials	1: Got Chills...They're Multipliyin': Exponential Functions and Rational Exponents pp. M3-89A–M3-106
		MATHia Software	3: Exploring Functions	4: Rational Exponents	1: Properties of Rational Exponents
N.RN.2	Rewrite expressions involving radicals and rational exponents using the properties of exponents.	Textbook	1: Reasoning With Shapes	2: Justifying Line and Angle Relationships	4: Identical Twins: Perpendicular Bisector and Isosceles Triangle Theorems pp. M1-143A–M1-164
			3: Exploring Functions	2: Exponentials	1: Got Chills...They're Multipliyin': Exponential Functions and Rational Exponents pp. M3-89A–M3-106
			4: Seeing Structure	1: Solving Quadratic Equations	2: Solutions, More or Less: Representing Solutions to Quadratic Equations pp. M4-33A–M4-46 5: Ladies and Gents, Please Welcome the Quadratic Formula: The Quadratic Formula pp. M4-81A–M4-102
		MATHia Software	3: Exploring Functions	4: Rational Exponents	2: Rewriting Expressions with Radical and Rational Exponents
N.RN.3	Explain why the sum or product of two rational numbers is rational; that the sum of a rational number and an irrational number is irrational; and that the product of a nonzero rational number and an irrational number is irrational.	Textbook	4: Seeing Structure	1: Solving Quadratic Equations	5: Ladies and Gents, Please Welcome the Quadratic Formula: The Quadratic Formula pp. M4-81A–M4-102
					5: Ladies and Gents, Please Welcome the Quadratic Formula: The Quadratic Formula pp. M4-81A–M4-102
N.CN.1	Know there is a complex number i such that $i^2 = -1$, and every complex number has the form $a + bi$ with a and b real.	Textbook	4: Seeing Structure	1: Solving Quadratic Equations	5: Ladies and Gents, Please Welcome the Quadratic Formula: The Quadratic Formula pp. M4-81A–M4-102
				2: Applications of Quadratics	1: i Want to Believe: Imaginary and Complex Numbers pp. M4-115–M4-136
		MATHia Software	4: Seeing Structure	5: Operations with Complex Numbers	1: Introduction to Complex Numbers 2: Simplifying Radicals with Negative Radicands 3: Simplifying Powers of i

Standard ID	Description	Location	Module	Topic (Textbook)/ Unit(MATHia Software)	Lesson (Textbook) / Workspace (MATHia Software)
N.CN.2	Use the relation $i^2 = -1$ and the commutative, associative, and distributive properties to add, subtract, and multiply complex numbers.	Textbook	4: Seeing Structure	2: Applications of Quadratics	1: <i>i</i> Want to Believe: Imaginary and Complex Numbers pp. M4-115–M4-136
		MATHia Software	4: Seeing Structure	5: Operations with Complex Numbers	4: Adding and Subtracting Complex Numbers 5: Multiplying Complex Numbers
N.CN.7	Solve quadratic equations with real coefficients that have complex solutions.	Textbook	4: Seeing Structure	2: Applications of Quadratics	1: <i>i</i> Want to Believe: Imaginary and Complex Numbers pp. M4-115–M4-136
		MATHia Software	4: Seeing Structure	5: Operations with Complex Numbers	6: Solving Quadratic Equations with Complex Roots
N.CN.8	(+) Extend polynomial identities to the complex numbers. For example, rewrite $x^2 + 4$ as $(x + 2i)(x - 2i)$.	Textbook	4: Seeing Structure	2: Applications of Quadratics	1: <i>i</i> Want to Believe: Imaginary and Complex Numbers pp. M4-115–M4-136
N.CN.9	(+) Know the Fundamental Theorem of Algebra; show that it is true for quadratic polynomials.	Textbook	4: Seeing Structure	2: Applications of Quadratics	1: <i>i</i> Want to Believe: Imaginary and Complex Numbers pp. M4-115–M4-136
A.SSE.1a	Interpret parts of an expression, such as terms, factors, and coefficients.	Textbook	3: Exploring Functions	3: Introduction to Quadratic Functions	2: Endless Forms Most Beautiful: Key Characteristics of Quadratic Functions pp. M3-167A–M3-190 4: You Lose Some, You Lose Some: Comparing Functions Using Key Characteristics and Average Rate of Change pp. M3-217A–M3-232
			4: Seeing Structure	1: Solving Quadratic Equations	1: This Time, With Polynomials: Adding, Subtracting, and Multiplying Polynomials pp. M4-7A–M4-32
A.SSE.1b	Interpret complicated expressions by viewing one or more of their parts as a single entity. For example, interpret $P(1+r)^n$ as the product of P and a factor not depending on P .	Textbook	3: Exploring Functions	2: Exponentials	2: Turn That Frown Upside Down: Growth and Decay Functions pp. M3-107A–M3-118
			4: Seeing Structure	1: Solving Quadratic Equations	5: Ladies and Gents, Please Welcome the Quadratic Formula!: The Quadratic Formula pp. M4-81A–M4-102
A.SSE.2	Use the structure of an expression to identify ways to rewrite it. For example, see $x^4 - y^4$ as $(x^2)^2 - (y^2)^2$, thus recognizing it as a difference of squares that can be factored as $(x^2 - y^2)(x^2 + y^2)$.	Textbook	4: Seeing Structure	1: Solving Quadratic Equations	2: Solutions, More or Less: Representing Solutions to Quadratic Equations pp. M4-33A–M4-46 3: Transforming Solutions: Solutions to Quadratic Equations in Vertex Form pp. M4-47A–M4-58
		MATHia Software	4: Seeing Structure	2: Quadratic Expression Factoring	5: Factoring Using Difference of Squares

Standard ID	Description	Location	Module	Topic (Textbook)/ Unit(MATHia Software)	Lesson (Textbook) / Workspace (MATHia Software)	
A.SSE.3a	Factor a quadratic expression to reveal the zeros of the function it defines.	Textbook	3: Exploring Functions	3: Introduction to Quadratic Functions	2: Endless Forms Most Beautiful: Key Characteristics of Quadratic Functions pp. M3-167A–M3-190 3: More Than Meets the Eye: Transformations of Quadratic Functions pp. M3-191A–M3-216	
			4: Seeing Structure	1: Solving Quadratic Equations	2: Solutions, More or Less: Representing Solutions to Quadratic Equations pp. M4-33A–M4-46 3: Transforming Solutions: Solutions to Quadratic Equations in Vertex Form pp. M4-47A–M4-58	
		MATHia Software	4: Seeing Structure	2: Quadratic Expression Factoring	3: Forms of Quadratics	3: Factoring Trinomials with Coefficients of One 4: Factoring Trinomials with Coefficients Other Than One 6: Factoring Quadratic Expressions
						3: Converting Quadratics to General Form 4: Converting Quadratics to Factored Form 5: Converting Quadratics to Vertex Form
				1: Solving Quadratic Equations	3: Forms of Quadratics	4: The Missing Link: Factoring and Completing the Square pp. M4-59A–M4-80
						3: Converting Quadratics to General Form 4: Converting Quadratics to Factored Form 5: Converting Quadratics to Vertex Form
A.SSE.3b	Complete the square in a quadratic expression to reveal the maximum or minimum value of the function it defines.	Textbook	4: Seeing Structure	1: Solving Quadratic Equations	4: The Missing Link: Factoring and Completing the Square pp. M4-59A–M4-80	
		MATHia Software	4: Seeing Structure	3: Forms of Quadratics	3: Converting Quadratics to General Form 4: Converting Quadratics to Factored Form 5: Converting Quadratics to Vertex Form	
A.SSE.3c	Use the properties of exponents to transform expressions for exponential functions. For example the expression $1.15t$ can be rewritten as $(1.15^{(1/12)})^{12t} \approx 1.012^{12t}$ to reveal the approximate equivalent monthly interest rate if the annual rate is 15%.	Textbook	3: Exploring Functions	2: Exponentials	3: Just So . . . Basic: Horizontal Dilations of Exponential Functions pp. M3-119A–M3-132	

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A.APR.1	Understand that polynomials form a system analogous to the integers, namely, they are closed under the operations of addition, subtraction, and multiplication; add, subtract, and multiply polynomials.	Textbook	4: Seeing Structure	1: Solving Quadratic Equations	1: This Time, With Polynomials: Adding, Subtracting, and Multiplying Polynomials pp. M4-7A–M4-32
		MATHia Software	4: Seeing Structure	1: Polynomial Operations	1: Introduction to Polynomial Arithmetic
					2: Adding Polynomials
					3: Subtracting Polynomials
					4: Using a Factor Table to Multiply Polynomials
5: Multiplying Polynomials					
2: Quadratic Expression Factoring	1: Using a Factor Table to Multiply Binomials				
2: Multiplying Binomials					
A.APR.3	Identify zeros of polynomials when suitable factorizations are available, and use the zeros to construct a rough graph of the function defined by the polynomial.	Textbook	3: Exploring Functions	3: Introduction to Quadratic Functions	2: Endless Forms Most Beautiful: Key Characteristics of Quadratic Functions pp. M3-167A–M3-190
A.CED.1	Create equations and inequalities in one variable and use them to solve problems. Include equations arising from linear and quadratic functions, and simple rational and exponential functions.	Textbook	3: Exploring Functions	2: Exponentials	2: Turn That Frown Upside Down: Growth and Decay Functions pp. M3-107A–M3-118
			4: Seeing Structure	2: Applications of Quadratic Equations	2: Ahead of the Curve: Solving Quadratic Inequalities pp. M4-137A–M4-146
		MATHia Software	3: Exploring Functions	6: Quadratic Models in Factored Form	1: Modeling Area as Product of Monomial and Binomial
					2: Modeling Area as Product of Two Binomials
A.CED.2	Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.	Textbook	3: Exploring Functions	1: Functions Derived from Linear Relationships	2: Play Ball!: Absolute Value Equations and Inequalities pp. M3-25A–M3-38
			4: Seeing Structure	2: Applications of Quadratic Equations	2: Ahead of the Curve: Solving Quadratic Inequalities pp. M4-137A–M4-146
					3: All Systems Are Go!: Systems of Quadratic Equations pp. M4-147A–M4-158

Standard ID	Description	Location	Module	Topic (Textbook)/ Unit(MATHia Software)	Lesson (Textbook) / Workspace (MATHia Software)
A.CED.3	Represent constraints by equations or inequalities, and by systems of equations and/or inequalities, and interpret solutions as viable or nonviable options in a modeling context. For example, represent inequalities describing nutritional and cost constraints on combinations of different foods.	Textbook	3: Exploring Functions	1: Functions Derived from Linear Relationships	2: Play Ball!: Absolute Value Equations and Inequalities pp. M3-25A–M3-38
			4: Seeing Structure	2: Applications of Quadratic Equations	2: Ahead of the Curve: Solving Quadratic Inequalities pp. M4-137A–M4-146 3: All Systems Are Go!: Systems of Quadratic Equations pp. M4-147A–M4-158
		MATHia Software	3: Exploring Functions	1: Absolute Value Equations	1: Graphing Simple Absolute Value Equations Using Number Lines
					2: Solving Absolute Value Equations 3: Reasoning About Absolute Value Inequalities
A.CED.4	Rearrange formulas to highlight a quantity of interest, using the same reasoning as in solving equations.	Textbook	3: Exploring Functions	3: Introduction to Quadratic Functions	4: You Lose Some, You Lose Some: Comparing Functions Using Key Characteristics and Average Rate of Change pp. M3-217A–M3-232
A.REI.4	Solve quadratic equations in one variable.	Textbook	4: Seeing Structure	1: Solving Quadratic Equations	5: Ladies and Gents, Please Welcome the Quadratic Formula!: The Quadratic Formula pp. M4-81A–M4-102
				2: Applications of Quadratic Equations	2: Ahead of the Curve: Solving Quadratic Inequalities pp. M4-137A–M4-146
A.REI.4a	Use the method of completing the square to transform any quadratic equation in x into an equation of the form $(x - p)^2 = q$ that has the same solutions. Derive the quadratic formula from this form.	Textbook	4: Seeing Structure	1: Solving Quadratic Equations	4: The Missing Link: Factoring and Completing the Square pp. M4-59A–M4-80
					5: Ladies and Gents, Please Welcome the Quadratic Formula!: The Quadratic Formula pp. M4-81A–M4-102
		MATHia Software	4: Seeing Structure	3: Forms of Quadratics	2: Ahead of the Curve: Solving Quadratic Inequalities pp. M4-137A–M4-146 1: Completing the Square

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A.REI.B.4b	Solve quadratic equations by inspection (e.g., for $x^2 = 49$), taking square roots, completing the square, the quadratic formula and factoring, as appropriate to the initial form of the equation. Recognize when the quadratic formula gives complex solutions and write them as $a \pm bi$ for real numbers a and b .	Textbook	4: Seeing Structure	1: Solving Quadratic Equations	2: Solutions, More or Less: Representing Solutions to Quadratic Equations pp. M4-33A–M4-46
A.REI.4b	Solve quadratic equations by inspection (e.g., for $x^2 = 49$), taking square roots, completing the square, the quadratic formula and factoring, as appropriate to the initial form of the equation. Recognize when the quadratic formula gives complex solutions and write them as $a \pm bi$ for real numbers a and b .	Textbook	4: Seeing Structure	1: Solving Quadratic Equations	5: Ladies and Gents, Please Welcome the Quadratic Formula! The Quadratic Formula pp. M4-81A–M4-102
				2: Applications of Quadratics	1: i Want to Believe: Imaginary and Complex Numbers pp. M4-115–M4-136
				2: Applications of Quadratic Equations	2: Ahead of the Curve: Solving Quadratic Inequalities pp. M4-137A–M4-146
		MATHia Software	4: Seeing Structure	4: Quadratic Equation Solving	2: Solving Quadratic Equations by Factoring 3: Solving Quadratic Equations
A.REI.7	Solve a simple system consisting of a linear equation and a quadratic equation in two variables algebraically and graphically. For example, find the points of intersection between the line $y = -3x$ and the circle $x^2 + y^2 = 3$.	Textbook	4: Seeing Structure	2: Applications of Quadratic Equations	3: All Systems Are Go!: Systems of Quadratic Equations pp. M4-147A–M4-158
				3: Circles on a Coordinate Plane	2: A Blip on the Radar: Determining Points on a Circle pp. M4-201A–M4-216
A.REI.10	Understand that the graph of an equation in two variables is the set of all its solutions plotted in the coordinate plane, often forming a curve (which could be a line).	Textbook	3: Exploring Functions	3: Introduction to Quadratic Functions	1: Up and Down or Down and Up: Exploring Quadratic Functions pp. M3-151A–M3-166
			4: Seeing Structure	1: Solving Quadratic Equations	2: Solutions, More or Less: Representing Solutions to Quadratic Equations pp. M4-33A–M4-46

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A.REI.11	Explain why the x -coordinates of the points where the graphs of the equations $y = f(x)$ and $y = g(x)$ intersect are the solutions of the equation $f(x) = g(x)$; find the solutions approximately, e.g., using technology to graph the functions, make tables of values, or find successive approximations. Include cases where $f(x)$ and/or $g(x)$ are linear, polynomial, rational, absolute value, exponential, and logarithmic functions.*	Textbook	3: Exploring Functions	1: Functions Derived from Linear Relationships	2: Play Ball!: Absolute Value Equations and Inequalities pp. M3-25A–M3-38
			4: Seeing Structure	3: Introduction to Quadratic Functions	1: Up and Down or Down and Up: Exploring Quadratic Functions pp. M3-151A–M3-166
		MATHia Software	4: Seeing Structure	2: Applications of Quadratic Equations	3: All Systems Are Go!: Systems of Quadratic Equations pp. M4-147A–M4-158
F.IF.4	For a function that models a relationship between two quantities, interpret key features of graphs and tables in terms of the quantities, and sketch graphs showing key features given a verbal description of the relationship. Key features include: intercepts; intervals where the function is increasing, decreasing, positive, or negative; relative maximums and minimums; symmetries; end behavior; and periodicity.*	Textbook	3: Exploring Functions	1: Functions Derived from Linear Relationships	3: I Graph in Pieces: Linear Piecewise Functions pp. M3-39A–M3-52
				3: Introduction to Quadratic Functions	1: Up and Down or Down and Up: Exploring Quadratic Functions pp. M3-151A–M3-166
		MATHia Software	3: Exploring Functions	6: Quadratic Models in Factored Form	2: Endless Forms Most Beautiful: Key Characteristics of Quadratic Functions pp. M3-167A–M3-190
				7: Quadratic Models in General Form	3: Interpreting Maximums of Quadratic Models
F.IF.5	Relate the domain of a function to its graph and, where applicable, to the quantitative relationship it describes.*	Textbook	3: Exploring Functions	3: Introduction to Quadratic Functions	1: Up and Down or Down and Up: Exploring Quadratic Functions pp. M3-151A–M3-166
F.IF.6	Calculate and interpret the average rate of change of a function (presented symbolically or as a table) over a specified interval. Estimate the rate of change from a graph.*	Textbook	3: Exploring Functions	3: Introduction to Quadratic Functions	2: Endless Forms Most Beautiful: Key Characteristics of Quadratic Functions pp. M3-167A–M3-190
F.IF.7a	Graph linear and quadratic functions and show intercepts, maxima, and minima.	Textbook	3: Exploring Functions	3: Introduction to Quadratic Functions	1: Up and Down or Down and Up: Exploring Quadratic Functions pp. M3-151A–M3-166
		MATHia Software	4: Seeing Structure	3: Forms of Quadratics	2: Endless Forms Most Beautiful: Key Characteristics of Quadratic Functions pp. M3-167A–M3-190
					6: Sketching Quadratic Functions

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F.IF.7b	Graph square root, cube root, and piecewise-defined functions, including step functions and absolute value functions.	Textbook	3: Exploring Functions	1: Functions Derived from Linear Relationships	1: Putting the V in Absolute Value: Building Volume and Surface Area Formulas for Pyramids, Cones, and Spheres pp. M3-7A–M3-24	
			4: Seeing Structure	2: Applications of Quadratic Equations	2: Play Ball!: Absolute Value Equations and Inequalities pp. M3-25A–M3-38	
		MATHia Software	3: Exploring Functions	2: Graphs of Piecewise Functions	3: I Graph in Pieces: Linear Piecewise Functions pp. M3-39A–M3-52	4: Step by Step: Step Functions pp. M3-53–M3-64
					4: Model Behavior: Using Quadratic Functions to Model Data pp. M4-159A–M4-174	
					1: Introduction to Piecewise Functions	
					2: Graphing Linear Piecewise Functions	
3: Interpreting Piecewise Functions						
4: Using Linear Piecewise Functions						
5: Analyzing Step Functions						
F.IF.8a	Use the process of factoring and completing the square in a quadratic function to show zeros, extreme values, and symmetry of the graph, and interpret these in terms of a context.	Textbook	3: Exploring Functions	3: Introduction to Quadratic Functions	2: Endless Forms Most Beautiful: Key Characteristics of Quadratic Functions pp. M3-167A–M3-190	
			4: Seeing Structure	1: Solving Quadratic Equations	4: The Missing Link: Factoring and Completing the Square pp. M4-59A–M4-80	
		MATHia Software	4: Seeing Structure	3: Forms of Quadratics	1: Completing the Square	
					2: Identifying the Properties of Quadratic Functions	
					3: Converting Quadratics to General Form	
4: Converting Quadratics to Factored Form						
5: Converting Quadratics to Vertex Form						
F.IF.8b	Use the properties of exponents to interpret expressions for exponential functions.	Textbook	3: Exploring Functions	2: Exponentials	2: Turn That Frown Upside Down: Growth and Decay Functions pp. M3-107A–M3-118	
F.IF.9	Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions).	Textbook	3: Exploring Functions	3: Introduction to Quadratic Functions	4: You Lose Some, You Lose Some: Comparing Functions Using Key Characteristics and Average Rate of Change pp. M3-217A–M3-232	

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F.IF.9	Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions).	MATHia Software	4: Seeing Structure	3: Forms of Quadratics	7: Comparing Quadratic Functions in Different Forms	
F.BF.1a	Determine an explicit expression, a recursive process, or steps for calculation from a context.	Textbook	3: Exploring Functions	2: Exponentials	1: Got Chills...They're Multipliyin': Exponential Functions and Rational Exponents pp. M3-89A–M3-106	
F.BF.1b	Combine standard function types using arithmetic operations. For example, build a function that models the temperature of a cooling body by adding a constant function to a decaying exponential, and relate these functions to the model.	Textbook	3: Exploring Functions	2: Exponentials	4: Saving Strategies: Modeling with and Combining Function Types pp. M3-133–M3-142	
		MATHia Software	4: Seeing Structure	6: Function Operations	3: Adding and Subtracting Linear Functions	
F.BF.3	Identify the effect on the graph of replacing $f(x)$ by $f(x) + k$, $kf(x)$, and $f(x + k)$ for specific values of k (both positive and negative); find the value of k given the graphs. Experiment with cases and illustrate an explanation of the effects on the graph using technology. Include recognizing even and odd functions from their graphs and algebraic expressions for them.	Textbook	3: Exploring Functions	1: Functions Derived from Linear Relationships	1: Putting the V in Absolute Value: Building Volume and Surface Area Formulas for Pyramids, Cones, and Spheres pp. M3-7A–M3-24	
				2: Exponentials	3: Just So . . . Basic: Horizontal Dilations of Exponential Functions pp. M3-119A–M3-132	
				3: Introduction to Quadratic Functions	3: More Than Meets the Eye: Transformations of Quadratic Functions pp. M3-191A–M3-216	
		MATHia Software	3: Exploring Functions	5: Linear and Exponential Transformations	1: Introduction to Transforming Exponential Functions	1: Introduction to Transforming Exponential Functions
					2: Shifting Vertically	2: Shifting Vertically
					3: Reflecting and Dilating using Graphs	3: Reflecting and Dilating using Graphs
					4: Shifting Horizontally	4: Shifting Horizontally
					5: Transforming using Tables of Values	5: Transforming using Tables of Values
					6: Using Multiple Transformations	6: Using Multiple Transformations
				8: Linear and Quadratic Transformations	1: Shifting Vertically	1: Shifting Vertically
2: Reflecting and Dilating using Graphs	2: Reflecting and Dilating using Graphs					
3: Shifting Horizontally	3: Shifting Horizontally					
4: Seeing Structure	6: Function Operations	4: Transforming Using Tables of Values	4: Transforming Using Tables of Values			
		5: Using Multiple Transformations	5: Using Multiple Transformations			
				2: Operating with Functions on the Coordinate Plane	2: Operating with Functions on the Coordinate Plane	

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F.BF.4	Find inverse functions.	MATHia Software	4: Seeing Structure	7: Inverses of Functions	1: Recognizing Graphs of Inverses
					2: Calculating Inverses of Linear Functions
F.BF.4a	Solve an equation of the form $f(x) = c$ for a simple function f that has an inverse and write an expression for the inverse. For example, $f(x) = 2x^3$ or $f(x) = (x + 1)/(x - 1)$ for $x \neq 1$.	Textbook	3: Exploring Functions	1: Functions Derived from Linear Relationships	5: A Riddle Wrapped in a Mystery: Inverses of Linear Functions pp. M3-65–M3-78
			4: Seeing Structure	2: Applications of Quadratic Equations	4: Model Behavior: Using Quadratic Functions to Model Data pp. M4-159A–M4-174
F.BF.4d	(+) Produce an invertible function from a non-invertible function by restricting the domain.	Textbook	4: Seeing Structure	2: Applications of Quadratic Equations	4: Model Behavior: Using Quadratic Functions to Model Data pp. M4-159A–M4-174
F.LE.1b	Recognize situations in which one quantity changes at a constant rate per unit interval relative to another.	MATHia Software	3: Exploring Functions	3: Comparing Linear and Exponential Models	1: Recognizing Linear and Exponential Models
F.LE.1c	Recognize situations in which a quantity grows or decays by a constant percent rate per unit interval relative to another.	Textbook	3: Exploring Functions	2: Exponentials	2: Turn That Frown Upside Down: Growth and Decay Functions pp. M3-107A–M3-118
		MATHia Software	3: Exploring Functions	3: Comparing Linear and Exponential Models	1: Recognizing Linear and Exponential Models 2: Recognizing Growth and Decay
F.LE.3	Observe using graphs and tables that a quantity increasing exponentially eventually exceeds a quantity increasing linearly, quadratically, or (more generally) as a polynomial function.	Textbook	3: Exploring Functions	2: Exponentials	2: Turn That Frown Upside Down: Growth and Decay Functions pp. M3-107A–M3-118
				3: Introduction to Quadratic Functions	4: You Lose Some, You Lose Some: Comparing Functions Using Key Characteristics and Average Rate of Change pp. M3-217A–M3-232
F.LE.5	Interpret the parameters in a linear or exponential function in terms of a context.	Textbook	3: Exploring Functions	2: Exponentials	2: Turn That Frown Upside Down: Growth and Decay Functions pp. M3-107A–M3-118
F.TF.8	Prove the Pythagorean identity $\sin^2(\theta) + \cos^2(\theta) = 1$ and use it to find $\sin(\theta)$, $\cos(\theta)$, or $\tan(\theta)$ given $\sin(\theta)$, $\cos(\theta)$, or $\tan(\theta)$ and the quadrant of the angle.	Textbook	4: Seeing Structure	3: Circles on the Coordinate Plane	3: $\sin^2 \theta + \cos^2 \theta = 1$: The Pythagorean Identity pp. M4-217–M4-226
G.CO.1	Know precise definitions of angle, circle, perpendicular line, parallel line, and line segment, based on the undefined notions of point, line, distance along a line, and distance around a circular arc.	MATHia Software	1: Reasoning with Shapes	1: Lines, Rays, Segments and Angles	1: Naming Lines, Rays, Segments, and Angles 2: Working with Measures of Segments and Angles
				5: Introduction to Proofs with Segments and Angles	1: Introduction to Proofs 3: Completing Measure Proofs

Standard ID	Description	Location	Module	Topic (Textbook)/ Unit(MATHia Software)	Lesson (Textbook) / Workspace (MATHia Software)
G.CO.7	Use the definition of congruence in terms of rigid motions to show that two triangles are congruent if and only if corresponding pairs of sides and corresponding pairs of angles are congruent.	MATHia Software	1: Reasoning with Shapes	8: Triangle Congruence	1: Introduction to Triangle Congruence
G.CO.8	Explain how the criteria for triangle congruence (ASA, SAS, and SSS) follow from the definition of congruence in terms of rigid motions.	MATHia Software	1: Reasoning with Shapes	8: Triangle Congruence	1: Introduction to Triangle Congruence
G.CO.9	Prove theorems about lines and angles. Theorems include: vertical angles are congruent; when a transversal crosses parallel lines, alternate interior angles are congruent and corresponding angles are congruent; points on a perpendicular bisector of a line segment are exactly those equidistant from the segment's endpoints.	Textbook	1: Reasoning With Shapes	1: Composing and Decomposing Shapes	1: Running Circles Around Geometry: Using Circles to Make Conjectures pp. M1-7A-M1-22
				2: Justifying Line and Angle Relationships	1: Proof Positive: Forms of Proof pp. M1-85A-M1-106
					2: A Parallel Universe: Proving Parallel Line Theorems pp. M1-107A-M1-126
					4: Identical Twins: Perpendicular Bisector and Isosceles Triangle Theorems pp. M1-143A-M1-164
		MATHia Software	1: Reasoning with Shapes	4: Angle Properties	1: Calculating and Justifying Angle Measures 2: Calculating Angle Measures
				5: Introduction to Proofs with Segments and Angles	2: Connecting Steps in Angle Proofs 4: Using Angle Theorems
				6: Lines Cut by a Transversal	1: Classifying Angles Formed by Transversals 2: Calculating Angle Measures Formed by Transversals
					3: Calculating Angles Formed by Multiple Transversals
					1: Proving Parallel Lines Theorems 2: Proving the Converses of Parallel Lines Theorems
				7: Parallel Lines Theorems	

Standard ID	Description	Location	Module	Topic (Textbook)/ Unit(MATHia Software)	Lesson (Textbook) / Workspace (MATHia Software)
G.CO.10	Prove theorems about triangles. Theorems include: measures of interior angles of a triangle sum to 180° ; base angles of isosceles triangles are congruent; the segment joining midpoints of two sides of a triangle is parallel to the third side and half the length; the medians of a triangle meet at a point.	Textbook	1: Reasoning With Shapes	1: Composing and Decomposing Shapes	1: Running Circles Around Geometry: Using Circles to Make Conjectures pp. M1-7A–M1-22
					4: Tri Tri- Tri- and Separate Them: Conjectures About Triangles pp. M1-41A–M1-54
					4: What's the Point?: Points of Concurrency pp. M1-55A–M1-72
				2: Justifying Line and Angle Relationships	3: Ins and Outs: Interior and Exterior Angles of Polygons pp. M1-127A–M1-142
					4: Identical Twins: Perpendicular Bisector and Isosceles Triangle Theorems pp. M1-143A–M1-164
				3: Using Congruence Theorems	1: SSS, SAS, AAS, . . . S.O.S!: Using Triangle Congruence to Determine Relationships Between Segments pp. M1-209A–M2-220
		MATHia Software	1: Reasoning with Shapes	8: Triangle Congruence	2: Proving Triangles Congruent using SAS and SSS
					3: Proving Triangles Congruent using AAS and ASA
					4: Proving Triangles Congruent using HL and HA
					5: Using Triangle Congruence
6: Proving Theorems using Congruent Triangles					
9: Triangle Theorems	1: Proving Triangle Theorems				
	2: Using Triangle Theorems				
G.CO.11	Prove theorems about parallelograms. Theorems include: opposite sides are congruent, opposite angles are congruent, the diagonals of a parallelogram bisect each other, and conversely, rectangles are parallelograms with congruent diagonals.	Textbook	1: Reasoning With Shapes	1: Composing and Decomposing Shapes	2: The Quad Squad: Conjectures About Quadrilaterals pp. M1-23A–M1-40
				3: Using Congruence Theorems	2: Props To You: Properties of Quadrilaterals pp. M1-221A–M2-248
		MATHia Software	1: Reasoning with Shapes	10: Properties of Parallelograms	1: Understanding Parallelograms
				11: Parallelogram Proofs	2: Determining Parts of Quadrilaterals and Parallelograms
					1: Proofs about Parallelograms

Standard ID	Description	Location	Module	Topic (Textbook)/ Unit(MATHia Software)	Lesson (Textbook) / Workspace (MATHia Software)
G.SRT.1a	A dilation takes a line not passing through the center of the dilation to a parallel line, and leaves a line passing through the center unchanged.	Textbook	2: Investigating Proportionality	1: Similarity	3: Keep It in Proportion: Theorems About Proportionality pp. M2-37A–M2-64
G.SRT.1b	The dilation of a line segment is longer or shorter in the ratio given by the scale factor.	Textbook	2: Investigating Proportionality	1: Similarity	1: Big, Little, Big, Little: Dilating Figures to Create Similar Figures pp. M2-7A–M2-21
G.SRT.2	Given two figures, use the definition of similarity in terms of similarity transformations to decide if they are similar; explain using similarity transformations the meaning of similarity for triangles as the equality of all corresponding pairs of angles and the proportionality of all corresponding pairs of sides.	Textbook	2: Investigating Proportionality	1: Similarity	1: Big, Little, Big, Little: Dilating Figures to Create Similar Figures pp. M2-7A–M2-21
		MATHia Software	2: Investigating Proportionality	1: Similar Triangles	2: Similar Triangles or Not?: Establishing Triangle Similarity Criteria pp. M2-23A–M2-35
G.SRT.3	Use the properties of similarity transformations to establish the AA criterion for two triangles to be similar.	Textbook	2: Investigating Proportionality	1: Similarity	1: Understanding Similarity
					2: Similar Triangles or Not?: Establishing Triangle Similarity Criteria pp. M2-23A–M2-35
G.SRT.4	Prove theorems about triangles. Theorems include: a line parallel to one side of a triangle divides the other two proportionally, and conversely; the Pythagorean Theorem proved using triangle similarity.	Textbook	2: Investigating Proportionality	1: Similarity	4: This Isn't Your Average Mean: More Similar Triangles pp. M2-65A–M2-78
					3: Keep It in Proportion: Theorems About Proportionality pp. M2-37A–M2-64
G.SRT.5	Use congruence and similarity criteria for triangles to solve problems and to prove relationships in geometric figures.	Textbook	1: Reasoning With Shapes	3: Using Congruence Theorems	3: Proofs Using Similar Triangles
			2: Investigating Proportionality	1: Similarity	4: This Isn't Your Average Mean: More Similar Triangles pp. M2-65A–M2-78
		MATHia Software	2: Investigating Proportionality	1: Similar Triangles	5: Run It Up the Flagpole: Application of Similar Triangles pp. M2-79A–M2-93
					2: Calculating Corresponding Parts of Similar Triangles

Standard ID	Description	Location	Module	Topic (Textbook)/ Unit(MATHia Software)	Lesson (Textbook) / Workspace (MATHia Software)
G.SRT.6	Understand that by similarity, side ratios in right triangles are properties of the angles in the triangle, leading to definitions of trigonometric ratios for acute angles.	Textbook	2: Investigating Proportionality	2: Trigonometry	1: Three Angle Measure: Introduction to Trigonometry pp. M2-121A–M2-135 2: The Tangent Ratio: Tangent Ratio, Cotangent Ratio, and Inverse Tangent pp. M2-137A–M2-153 3: The Sine Ratio: Sine Ratio, Cosecant Ratio, and Inverse Sine pp. M2-155A–M2-169 4: The Cosine Ratio: Cosine Ratio, Secant Ratio, and Inverse Cosine pp. M2-171A–M2-185
		MATHia Software	2: Investigating Proportionality	2: Trigonometric Ratios	1: Introduction to Trigonometric Ratios
G.SRT.7	Explain and use the relationship between the sine and cosine of complementary angles.	Textbook	2: Investigating Proportionality	2: Trigonometry	5: We Complement Each Other: Complement Angle Relationships pp. M2-187A–M2-198
		MATHia Software	2: Investigating Proportionality	2: Trigonometric Ratios	2: Relating Sines and Cosines of Complementary Angles
G.SRT.8	Use trigonometric ratios and the Pythagorean Theorem to solve right triangles in applied problems.*	Textbook	2: Investigating Proportionality	2: Trigonometry	2: The Tangent Ratio: Tangent Ratio, Cotangent Ratio, and Inverse Tangent pp. M2-137A–M2-153
					3: The Sine Ratio: Sine Ratio, Cosecant Ratio, and Inverse Sine pp. M2-155A–M2-169
					4: The Cosine Ratio: Cosine Ratio, Secant Ratio, and Inverse Cosine pp. M2-171A–M2-185
		MATHia Software	2: Investigating Proportionality	3: Right Triangles and Trigonometric Ratios	1: Using One Trigonometric Ratio to Solve Problems 2: Using Multiple Trigonometric Ratios to Solve Problems

Standard ID	Description	Location	Module	Topic (Textbook)/ Unit(MATHia Software)	Lesson (Textbook) / Workspace (MATHia Software)
G.C.1	Prove that all circles are similar.	Textbook	1: Reasoning With Shapes	1: Composing and Decomposing Shapes	1: Running Circles Around Geometry: Using Circles to Make Conjectures pp. M1-7A–M1-22
			2: Investigating Proportionality	3: Circles and Volume	1: All Circles Great and Small: Similarity Relationships in Circles pp. M2-211A–M2-228
		MATHia Software	1: Reasoning with Shapes	2: Properties of Circles	1: Introduction to Circles
G.C.2	Identify and describe relationships among inscribed angles, radii, and chords. Include the relationship between central, inscribed, and circumscribed angles; inscribed angles on a diameter are right angles; the radius of a circle is perpendicular to the tangent where the radius intersects the circle.	Textbook	1: Reasoning With Shapes	1: Composing and Decomposing Shapes	1: Running Circles Around Geometry: Using Circles to Make Conjectures pp. M1-7A–M1-22
				2: Justifying Line and Angle Relationships	5: Corners in a Round Room: Angle Relationships Inside and Outside Circles pp. M1-165A–M1-194
				3: Using Congruence Theorems	3: Three-Chord Song: Relationships Between Chords pp. M1-249A–M1-263
		MATHia Software	1: Reasoning with Shapes	2: Properties of Circles	1: Introduction to Circles
				3: Angles in Circles	1: Determining Central and Inscribed Angles in Circles
2: Investigating Proportionality	4: Arc Length	2: Determining Chords in Circles 3: Determining Interior and Exterior Angles in Circles			
G.C.3	Construct the inscribed and circumscribed circles of a triangle, and prove properties of angles for a quadrilateral inscribed in a circle.	Textbook	1: Reasoning With Shapes	1: Composing and Decomposing Shapes	2: The Quad Squad: Conjectures About Quadrilaterals pp. M1-23A–M1-40
					4: Tri Tri- Tri- and Separate Them: Conjectures About Triangles pp. M1-41A–M1-54
					4: What's the Point?: Points of Concurrency pp. M1-55A–M1-72
		MATHia Software	1: Reasoning with Shapes	2: Justifying Line and Angle Relationships	5: Corners in a Round Room: Angle Relationships Inside and Outside Circles pp. M1-165A–M1-194
3: Angles in Circles	2: Angles of an Inscribed Quadrilateral				
G.C.4	(+) Construct a tangent line from a point outside a given circle to the circle.	Textbook	1: Reasoning With Shapes	2: Justifying Line and Angle Relationships	5: Corners in a Round Room: Angle Relationships Inside and Outside Circles pp. M1-165A–M1-194

Standard ID	Description	Location	Module	Topic (Textbook)/ Unit(MATHia Software)	Lesson (Textbook) / Workspace (MATHia Software)
G.C.5	Derive using similarity the fact that the length of the arc intercepted by an angle is proportional to the radius, and define the radian measure of the angle as the constant of proportionality; derive the formula for the area of a sector.	Textbook	2: Investigating Proportionality	3: Circles and Volume	1: All Circles Great and Small: Similarity Relationships in Circles pp. M2-211A–M2-228
		MATHia Software	2: Investigating Proportionality	4: Arc Length	2: A Slice of Pi: Sectors and Segments of a Circle pp. M2-229A–M2-248
G.GPE.1	Derive the equation of a circle of given center and radius using the Pythagorean Theorem; complete the square to find the center and radius of a circle given by an equation.	Textbook	4: Seeing Structure	3: Circles on a Coordinate Plane	1: X^2 Plus Y^2 Equals Radius ² : Deriving the Equation for a Circle pp. M4-187A–M4-200
		MATHia Software	4: Seeing Structure	8: Equation of a Circle	2: A Blip on the Radar: Determining Points on a Circle pp. M4-201A–M4-216
G.GPE.2	Derive the equation of a parabola given a focus and directrix.	Textbook	4: Seeing Structure	3: Circles on a Coordinate Plane	1: Deriving the Equation of a Circle
G.GPE.4	Use coordinates to prove simple geometric theorems algebraically. For example, prove or disprove that a figure defined by four given points in the coordinate plane is a rectangle; prove or disprove that the point $(1, \sqrt{3})$ lies on the circle centered at the origin and containing the point $(0, 2)$.	Textbook	4: Seeing Structure	3: Circles on a Coordinate Plane	2: Determining the Radius and Center of a Circle
G.GPE.6	Find the point on a directed line segment between two given points that partitions the segment in a given ratio.	Textbook	2: Investigating Proportionality	3: Circles on a Coordinate Plane	4: Going the Equidistance: Equation of a Parabola pp. M4-227–M4-254
				1: Similarity	2: A Blip on the Radar: Determining Points on a Circle pp. M4-201A–M4-216
					6: Jack's Spare Key: Partitioning Segments in Given Ratios pp. M2-95–M2-108

Standard ID	Description	Location	Module	Topic (Textbook)/ Unit(MATHia Software)	Lesson (Textbook) / Workspace (MATHia Software)
G.GMD.1	Give an informal argument for the formulas for the circumference of a circle, area of a circle, volume of a cylinder, pyramid, and cone. Use dissection arguments, Cavalieri's principle, and informal limit arguments.	Textbook	2: Investigating Proportionality	3: Circles and Volume	1: All Circles Great and Small: Similarity Relationships in Circles pp. M2-211A–M2-228
					2: A Slice of Pi: Sectors and Segments of a Circle pp. M2-229A–M2-248
					3: Cakes and Pancakes: Building Three-Dimensional Figures pp. M2-249A–M2-266
					4: Get to the Point: Building Volume and Surface Area Formulas for Pyramids, Cones, and Spheres pp. M2-267A–M2-290
G.GMD.3	Use volume formulas for cylinders, pyramids, cones, and spheres to solve problems.*	Textbook	2: Investigating Proportionality	3: Circles and Volume	4: Get to the Point: Building Volume and Surface Area Formulas for Pyramids, Cones, and Spheres pp. M2-267A–M2-290
					MATHia Software
		2: Calculating Volume of Pyramids			
		3: Calculating Volume of Cones			
4: Calculating Volume of Spheres					
G.MG.1	Use geometric shapes, their measures, and their properties to describe objects (e.g., modeling a tree trunk or a human torso as a cylinder).*	Textbook	2: Investigating Proportionality	3: Circles and Volume	4: Get to the Point: Building Volume and Surface Area Formulas for Pyramids, Cones, and Spheres pp. M2-267A–M2-290
G.MG.2	Apply concepts of density based on area and volume in modeling situations (e.g., persons per square mile, BTUs per cubic foot).*	Textbook	2: Investigating Proportionality	3: Circles and Volume	4: Get to the Point: Building Volume and Surface Area Formulas for Pyramids, Cones, and Spheres pp. M2-267A–M2-290
G.MG.3	Apply geometric methods to solve design problems (e.g., designing an object or structure to satisfy physical constraints or minimize cost; working with typographic grid systems based on ratios).*	Textbook	2: Investigating Proportionality	3: Circles and Volume	4: Get to the Point: Building Volume and Surface Area Formulas for Pyramids, Cones, and Spheres pp. M2-267A–M2-290
S.ID.6a	Fit a function to the data; use functions fitted to data to solve problems in the context of the data. Use given functions or choose a function suggested by the context. Emphasize linear, quadratic, and exponential models.	Textbook	4: Seeing Structure	2: Applications of Quadratic Equations	4: Model Behavior: Using Quadratic Functions to Model Data pp. M4-159A–M4-174
		MATHia Software	4: Seeing Structure	6: Function Operations	1: Using Regression Models

Standard ID	Description	Location	Module	Topic (Textbook)/ Unit(MATHia Software)	Lesson (Textbook) / Workspace (MATHia Software)
S.CP.1	Describe events as subsets of a sample space (the set of outcomes) using characteristics (or categories) of the outcomes, or as unions, intersections, or complements of other events ("or," "and," "not").	Textbook	5: Making Informed Decisions	1: Independence and Conditional Probability	1: What Are the Chances?: Compound Sample Spaces pp. M5-7A–M5-26
S.CP.2	Understand that two events A and B are independent if the probability of A and B occurring together is the product of their probabilities, and use this characterization to determine if they are independent.	Textbook	5: Making Informed Decisions	1: Independence and Conditional Probability	2: And?: Compound Probability with And pp. M5-27A–M5-40
		MATHia Software	5: Making Informed Decisions	1: Independence and Conditional Probability	4: And, Or, and More!: Calculating Compound Probability pp. M5-57A–M5-70
S.CP.3	Understand the conditional probability of A given B as $P(A \text{ and } B)/P(B)$, and interpret independence of A and B as saying that the conditional probability of A given B is the same as the probability of A , and the conditional probability of B given A is the same as the probability of B .	Textbook	5: Making Informed Decisions	2: Computing Probabilities	2: It All Depends: Conditional Probability pp. M5-99A–M5-112
		MATHia Software	5: Making Informed Decisions	1: Independence and Conditional Probability	2: Conditional Probability
S.CP.4	Construct and interpret two-way frequency tables of data when two categories are associated with each object being classified. Use the two-way table as a sample space to decide if events are independent and to approximate conditional probabilities. For example, collect data from a random sample of students in your school on their favorite subject among math, science, and English. Estimate the probability that a randomly selected student from your school will favor science given that the student is in tenth grade. Do the same for other subjects and compare the results.	Textbook	5: Making Informed Decisions	2: Computing Probabilities	1: Table Talk: Compound Probability for Data Displayed in Two-Way Tables pp. M5-81A–M5-98

Standard ID	Description	Location	Module	Topic (Textbook)/ Unit(MATHia Software)	Lesson (Textbook) / Workspace (MATHia Software)
S.CP.4	Construct and interpret two-way frequency tables of data when two categories are associated with each object being classified. Use the two-way table as a sample space to decide if events are independent and to approximate conditional probabilities. For example, collect data from a random sample of students in your school on their favorite subject among math, science, and English. Estimate the probability that a randomly selected student from your school will favor science given that the student is in tenth grade. Do the same for other subjects and compare the results.	MATHia Software	5: Making Informed Decisions	1: Independence and Conditional Probability	3: Understanding Frequency Tables
S.CP.5	Recognize and explain the concepts of conditional probability and independence in everyday language and everyday situations. For example, compare the chance of having lung cancer if you are a smoker with the chance of being a smoker if you have lung cancer.	Textbook	5: Making Informed Decisions	2: Computing Probabilities	2: It All Depends: Conditional Probability pp. M5-99A–M5-112
		MATHia Software	5: Making Informed Decisions	1: Independence and Conditional Probability	4: Recognizing Concepts of Conditional Probability
S.CP.6	Find the conditional probability of A given B as the fraction of B 's outcomes that also belong to A , and interpret the answer in terms of the model.	Textbook	5: Making Informed Decisions	2: Computing Probabilities	2: It All Depends: Conditional Probability pp. M5-99A–M5-112
		MATHia Software	5: Making Informed Decisions	1: Independence and Conditional Probability	2: Conditional Probability
S.CP.7	Apply the Addition Rule, $P(A \text{ or } B) = P(A) + P(B) - P(A \text{ and } B)$, and interpret the answer in terms of the model.	Textbook	5: Making Informed Decisions	1: Independence and Conditional Probability	3: Or?: Compound Probability with Or pp. M5-41A–M5-55 4: And, Or, and More!: Calculating Compound Probability pp. M5-57A–M5-70
		MATHia Software	5: Making Informed Decisions	1: Independence and Conditional Probability	5: Calculating Compound Probabilities
S.CP.8	(+) Apply the general Multiplication Rule in a uniform probability model, $P(A \text{ and } B) = P(A)P(B A) = P(B)P(A B)$, and interpret the answer in terms of the model.	Textbook	5: Making Informed Decisions	1: Independence and Conditional Probability	2: And?: Compound Probability with And pp. M5-27A–M5-40
					4: And, Or, and More!: Calculating Compound Probability pp. M5-57A–M5-70

Standard ID	Description	Location	Module	Topic (Textbook)/ Unit(MATHia Software)	Lesson (Textbook) / Workspace (MATHia Software)
S.CP.9	(+ Use permutations and combinations to compute probabilities of compound events and solve problems.	Textbook	5: Making Informed Decisions	2: Computing Probabilities	3: Give Me 5!: Permutations and Combinations pp. M5-113–M5-134
					4: A Different Kind of Court Trial: Independent Trials pp. M5-135–M5-148
S.MD.6	Use probabilities to make fair decisions (e.g., drawing by lots, using a random number generator).	Textbook	5: Making Informed Decisions	2: Computing Probabilities	5: What Do You Expect?: Expected Value pp. M5-148–M5-164
S.MD.7	Analyze decisions and strategies using probability concepts (e.g., product testing, medical testing, pulling a hockey goalie at the end of a game).	Textbook	5: Making Informed Decisions	2: Computing Probabilities	5: What Do You Expect?: Expected Value pp. M5-148–M5-164