CARNEGIE LEARNING

Table of Contents

Geometry High School Math Solution

Correlation to the New Mexico Content Standards for Mathematics

CARNEGIE LEARNING

Standard ID	Description	Location	Module	Topic (Textbook)/ Unit(MATHia Software)	Lesson (Textbook) / Workspace (MATHia Software)
N.RN.2	Rewrite expressions involving radicals and rational exponents using the properties of exponents.	Textbook	2: Establishing Congruence	2: Justifying Line and Angle Relationships	4: Identical Twins: Perpendicular Bisector and Isosceles Triangle Theorems pp. M2-119A–M2-139
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: Connecting Geometric and Algebraic Descriptions	2: Conic Sections	3: A Blip on the Radar: Determining Points on a Circle pp. M4-133A–M4-148
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: Connecting Geometric and Algebraic Descriptions	2: Conic Sections	4: $\sin^2\theta$ Plus $\cos^2\theta$ Equals 1^2: The Pythagorean Identity pp. M4-149–M4-158
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.	Textbook	1: Reasoning With Shapes	1: Using a Rectangular Coordinate System	2: Hip to Be Square: Constructing a Coordinate Plane pp. M1-17A–M1-31
				3: Rigid Motions on a Plane	1: Put Your Input In, Take Your Output Out: Geometric Components of Rigid Motions pp. M1-205A–M1-216
		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
			2: Establishing Congruence	3: Introduction to Proofs with Segments and Angles	1: Introduction to Proofs
					2: Completing Measure Proofs
G.CO.2	Represent transformations in the plane using, e.g., transparencies and geometry software; describe transformations as functions that take points in the plane as inputs and give other points as outputs. Compare transformations that preserve distance and angle to those that do not (e.g., translation versus horizontal stretch).	Textbook	1: Reasoning With Shapes	3: Rigid Motions on a Plane	2: Bow Thai: Translations as Functions pp. M1-217A–M1-228

Standard ID	Description	Location	Module	Topic (Textbook)/ Unit(MATHia Software)	Lesson (Textbook) / Workspace (MATHia Software)
G.CO.2	Represent transformations in the plane using, e.g., transparencies and geometry software; describe transformations as functions that take points in the plane as inputs and give other points as outputs. Compare transformations that preserve distance and angle to those that do not (e.g., translation versus horizontal stretch).	Textbook	1: Reasoning With Shapes	3: Rigid Motions on a Plane	3: Staring Back at Me: Reflections as Functions pp. M1-229A–M1-242
					4: Turn Yourself Around: Rotations as Functions pp. M1-243A–M1-256
G.CO.3	Given a rectangle, parallelogram, trapezoid, or regular polygon, describe the rotations and reflections that carry it onto itself.	Textbook	1: Reasoning With Shapes	3: Rigid Motions on a Plane	5: OKEECHOBEE: Reflectional and Rotational Symmetry pp. M1-257A–M1-266
		MATHia Software	1: Reasoning with Shapes	5: Rigid Motion	2: Rotations and Reflections on the Plane
					3: Rotational Symmetry
					4: Reflectional Symmetry
G.CO.4	Develop definitions of rotations, reflections, and translations in terms of angles, circles, perpendicular lines, parallel lines, and line segments.	Textbook	1: Reasoning With Shapes	3: Rigid Motions on a Plane	1: Put Your Input In, Take Your Output Out: Geometric Components of Rigid Motions pp. M1-205A–M1-216
					2: Bow Thai: Translations as Functions pp. M1-217A–M1-228
					3: Staring Back at Me: Reflections as Functions pp. M1-229A–M1-242
					4: Turn Yourself Around: Rotations as Functions pp. M1-243A–M1-256
		MATHia Software	1: Reasoning with Shapes	5: Rigid Motion	1: Developing Definitions of Rigid Motions
G.CO.5	Given a geometric figure and a rotation, reflection, or translation, draw the transformed figure using, e.g., graph paper, tracing paper, or geometry software. Specify a sequence of transformations that will carry a given figure onto another.	Textbook	1: Reasoning With Shapes	1: Using a Rectangular Coordinate System	2: Hip to Be Square: Constructing a Coordinate Plane pp. M1-17A–M1-31
				3: Rigid Motions on a Plane	3: Staring Back at Me: Reflections as Functions pp. M1-229A–M1-242
					4: Turn Yourself Around: Rotations as Functions pp. M1-243A–M1-256
		MATHia Software	1: Reasoning with Shapes	5: Rigid Motion	5: Specifying a Sequence of Transformations

Standard ID	Description	Location	Module	Topic (Textbook)/ Unit(MATHia Software)	Lesson (Textbook) / Workspace (MATHia Software)
G.CO.6	Use geometric descriptions of rigid motions to transform figures and to predict the effect of a given rigid motion on a given figure; given two figures, use the definition of congruence in terms of rigid motions to decide if they are congruent.	Textbook	1: Reasoning With Shapes	3: Rigid Motions on a Plane	1: Put Your Input In, Take Your Output Out: Geometric Components of Rigid Motions pp. M1-205A–M1-216
			2: Establishing Congruence	1: Congruence Through Transformations	3: I Never Forget a Face: Using Triangle Congruence to Solve Problems pp. M2-39A–M2-50
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.	Textbook	2: Establishing Congruence	1: Congruence Through Transformations	2: ASA, SAS, and SSS: Proving Triangle Congruence Theorems pp. M2-23A–M2-38
		MATHia Software	2: Establishing Congruence	1: 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.	Textbook	2: Establishing Congruence	1: Congruence Through Transformations	2: ASA, SAS, and SSS: Proving Triangle Congruence Theorems pp. M2-23A–M2-38
		MATHia Software	2: Establishing Congruence	1: 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	2: Composing and Decomposing Shapes	1: Running Circles Around Geometry: Using Circles to Make Conjectures pp. M1-111A–M1-126

Standard ID	Description	Location	Module	Topic (Textbook)/ Unit(MATHia Software)	Lesson (Textbook) / Workspace (MATHia Software)
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	2: Establishing Congruence	2: Justifying Line and Angle Relationships	1: Proof Positive: Forms of Proof pp. M2-61A–M2-82
					2: A Parallel Universe: Proving Parallel Line Theorems pp. M2-83A–M2-102
					4: Identical Twins: Perpendicular Bisector and Isosceles Triangle Theorems pp. M2-119A–M2-139
		MATHia Software	2: Establishing Congruence	2: Angle Properties	1: Calculating and Justifying Angle Measures
					2: Calculating Angle Measures
				3: Introduction to Proofs with Segments and Angles	3: Connecting Steps in Angle Proofs
					4: Using Angle Theorems
				4: Lines Cut by a Transversal	1: Classifying Angles Formed by Transversals
					2: Calculating Angles Formed by Transversals
					3: Calculating Angles Formed by Multiple Transversals
				5: Parallel Lines Theorems	1: Proving Parallel Lines Theorems
					2: Proving the Converses of Parallel Lines Theorems
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: Using a Rectangular Coordinate System	1: The Squariest Square: From Informal to Formal Geometric Thinking pp. M1-7A–M1-16

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	2: Composing and Decomposing Shapes	1: Running Circles Around Geometry: Using Circles to Make Conjectures pp. M1-111A–M1-126
					4: Tri Tri- Tri- and Separate Them: Conjectures About Triangles pp. M1-161A–M1-174
					4: What's the Point?: Points of Concurrency pp. M1-175A–M1-192
			2: Establishing Congruence	2: Justifying Line and Angle Relationships	3: Ins and Outs: Interior and Exterior Angles of Polygons pp. M2-103A–M2-118
					4: Identical Twins: Perpendicular Bisector and Isosceles Triangle Theorems pp. M2-119A–M2-139
				3: Using Congruence Theorems	1: SSS, SAS, AAS, . . . S.O.S!: Using Triangle Congruence to Determine Relationships Between Segments pp. M2-185A–M2-196
		MATHia Software	2: Establishing Congruence	1: Triangle Congruence	2: Using Triangle Congruence
				6: Proving Triangles Congruent	1: Proving Triangles Congruent using SAS and SSS
					2: Proving Triangles Congruent using AAS and ASA
					3: Proving Triangles Congruent using HL and HA
					4: Proving Theorems using Congruent Triangles
				7: 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: Using a Rectangular Coordinate System	1: The Squariest Square: From Informal to Formal Geometric Thinking pp. M1-7A–M1-16

Standard ID	Description	Location	Module	Topic (Textbook)/ Unit(MATHia Software)	Lesson (Textbook) / Workspace (MATHia Software)
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	2: Composing and Decomposing Shapes	2: The Quad Squad: Conjectures About Quadrilaterals pp. M1-127A–M1-144
			2: Establishing Congruence	3: Using Congruence Theorems	2: Props To You: Properties of Quadrilaterals pp. M2-197A–M2-223
		MATHia Software	2: Establishing Congruence	8: Properties of Parallelograms	1: Understanding Parallelograms
					2: Determining Parts of Quadrilaterals and Parallelograms
				9: Parallelogram Proofs	1: Proofs about Parallelograms
G.CO.12	Make formal geometric constructions with a variety of tools and methods (compass and straightedge, string, reflective devices, paper folding, dynamic geometric software, etc.). Copying a segment; copying an angle; bisecting a segment; bisecting an angle; constructing perpendicular lines, including the perpendicular bisector of a line segment; and constructing a line parallel to a given line through a point not on the line.	Textbook	1: Reasoning With Shapes	1: Using a Rectangular Coordinate System	2: Hip to Be Square: Constructing a Coordinate Plane pp. M1-17A–M1-31
					3: Ts and Train Tracks: Parallel and Perpendicular Lines pp. M1-33A–M1-50
				2: Composing and Decomposing Shapes	3: Into the Ring: Constructing an Inscribed Regular Polygon pp. M1-145A–M1-160
G.CO.13	Construct an equilateral triangle, a square, and a regular hexagon inscribed in a circle.	Textbook	1: Reasoning With Shapes	2: Composing and Decomposing Shapes	3: Into the Ring: Constructing an Inscribed Regular Polygon pp. M1-145A–M1-160
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	3: Investigating Proportionality	1: Similarity	3: Keep It in Proportion: Theorems About Proportionality pp. M3-37A–M3-64
G.SRT.1b	The dilation of a line segment is longer or shorter in the ratio given by the scale factor.	Textbook	3: Investigating Proportionality	1: Similarity	1: Big, Little, Big, Little: Dilating Figures to Create Similar Figures pp. M3-7A–M3-21
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	3: Investigating Proportionality	1: Similarity	1: Big, Little, Big, Little: Dilating Figures to Create Similar Figures pp. M3-7A–M3-21

Standard ID	Description	Location	Module	Topic (Textbook)/ Unit(MATHia Software)	Lesson (Textbook) / Workspace (MATHia Software)
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	3: Investigating Proportionality	1: Similarity	2: Similar Triangles or Not?: Establishing Triangle Similarity Criteria pp. M3-23A–M3-35
		MATHia Software	3: Investigating Proportionality	1: Similar Triangles	1: Understanding Similarity
G.SRT.3	Use the properties of similarity transformations to establish the AA criterion for two triangles to be similar.	Textbook	3: Investigating Proportionality	1: Similarity	2: Similar Triangles or Not?: Establishing Triangle Similarity Criteria pp. M3-23A–M3-35
					3: Keep It in Proportion: Theorems About Proportionality pp. M3-37A–M3-64
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	3: Investigating Proportionality	1: Similarity	3: Keep It in Proportion: Theorems About Proportionality pp. M3-37A–M3-64
					4: This Isn't Your Average Mean: More Similar Triangles pp. M3-65A–M3-78
G.SRT.5	Use congruence and similarity criteria for triangles to solve problems and to prove relationships in geometric figures.	Textbook	2: Establishing Congruence	3: Using Congruence Theorems	1: SSS, SAS, AAS, . . . S.O.S!: Using Triangle Congruence to Determine Relationships Between Segments pp. M2-185A–M2-196
			3: Investigating Proportionality	1: Similarity	4: This Isn't Your Average Mean: More Similar Triangles pp. M3-65A–M3-78
					5: Run It Up the Flagpole: Application of Similar Triangles pp. M3-79A–M3-93
		MATHia Software	3: Investigating Proportionality	1: Similar Triangles	2: Calculating Corresponding Parts of Similar Triangles
					3: Proofs Using Similar Triangles
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	3: Investigating Proportionality	2: Trigonometry	1: Three Angle Measure: Introduction to Trigonometry pp. M3-121A–M3-135

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	3: Investigating Proportionality	2: Trigonometry	2: The Tangent Ratio: Tangent Ratio, Cotangent Ratio, and Inverse Tangent pp. M3-137A–M3-153
					3: The Sine Ratio: Sine Ratio, Cosecant Ratio, and Inverse Sine pp. M3-155A–M3-169
					4: The Cosine Ratio: Cosine Ratio, Secant Ratio, and Inverse Cosine pp. M3-171A–M3-185
		MATHia Software	3: 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	3: Investigating Proportionality	2: Trigonometry	5: We Complement Each Other: Complement Angle Relationships pp. M3-187A–M3-198
		MATHia Software	3: 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	3: Investigating Proportionality	2: Trigonometry	2: The Tangent Ratio: Tangent Ratio, Cotangent Ratio, and Inverse Tangent pp. M3-137A–M3-153
					3: The Sine Ratio: Sine Ratio, Cosecant Ratio, and Inverse Sine pp. M3-155A–M3-169
					4: The Cosine Ratio: Cosine Ratio, Secant Ratio, and Inverse Cosine pp. M3-171A–M3-185
					5: We Complement Each Other: Complement Angle Relationships pp. M3-187A–M3-198
		MATHia Software	3: Investigating Proportionality	3: Right Triangles and Trigonometric Ratios	1: Using One Trigonometric Ratio to Solve Problems
					2: Using Multiple Trigonometric Ratios to Solve Problems
G.SRT.9	(+) Derive the formula $A = 1/2\ ab\ \sin(C)$ for the area of a triangle by drawing an auxiliary line from a vertex perpendicular to the opposite side.	Textbook	3: Investigating Proportionality	2: Trigonometry	6: A Deriving Force: Deriving the Triangle Area Formula, the Law of Sines, and the Law of Cosines pp. M3-199–M3-212
G.SRT.10	(+) Prove the Laws of Sines and Cosines and use them to solve problems.	Textbook	3: Investigating Proportionality	2: Trigonometry	6: A Deriving Force: Deriving the Triangle Area Formula, the Law of Sines, and the Law of Cosines pp. M3-199–M3-212

Standard ID	Description	Location	Module	Topic (Textbook)/ Unit(MATHia Software)	Lesson (Textbook) / Workspace (MATHia Software)
G.SRT.11	(+) Understand and apply the Law of Sines and the Law of Cosines to find unknown measurements in right and non-right triangles (e.g., surveying problems, resultant forces).	Textbook	3: Investigating Proportionality	2: Trigonometry	6: A Deriving Force: Deriving the Triangle Area Formula, the Law of Sines, and the Law of Cosines pp. M3-199–M3-212
G.C.1	Prove that all circles are similar.	Textbook	1: Reasoning With Shapes	2: Composing and Decomposing Shapes	1: Running Circles Around Geometry: Using Circles to Make Conjectures pp. M1-111A–M1-126
			4: Connecting Geometric and Algebraic Descriptions	1: Circles and Volume	1: All Circles Great and Small: Similarity Relationships in Circles pp. M4-7A–M4-24
		MATHia Software	1: Reasoning with Shapes	4: 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	2: Establishing Congruence	2: Justifying Line and Angle Relationships	5: Corners in a Round Room: Angle Relationships Inside and Outside Circles pp. M2-141A–M2-170
				3: Using Congruence Theorems	3: Three-Chord Song: Relationships Between Chords pp. M2-225A–M2-239
		MATHia Software	1: Reasoning with Shapes	4: Properties of Circles	1: Introduction to Circles
					2: Determining Central and Inscribed Angles in Circles
			4: Connecting Geometric and Algebraic Descriptions	1: 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	2: Composing and Decomposing Shapes	2: The Quad Squad: Conjectures About Quadrilaterals pp. M1-127A–M1-144
					4: What's the Point?: Points of Concurrency pp. M1-175A–M1-192
			2: Establishing Congruence	2: Justifying Line and Angle Relationships	5: Corners in a Round Room: Angle Relationships Inside and Outside Circles pp. M2-141A–M2-170
		MATHia Software	1: Reasoning with Shapes	4: Properties of Circles	3: Angles of an Inscribed Quadrilateral
G.C.4	(+) Construct a tangent line from a point outside a given circle to the circle.	Textbook	2: Establishing Congruence	2: Justifying Line and Angle Relationships	5: Corners in a Round Room: Angle Relationships Inside and Outside Circles pp. M2-141A–M2-170

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	4: Connecting Geometric and Algebraic Descriptions	1: Circles and Volume	1: All Circles Great and Small: Similarity Relationships in Circles pp. M4-7A–M4-24
					2: A Slice of Pi: Sectors and Segments of a Circle pp. M4-25A–M4-44
		MATHia Software	4: Connecting Geometric and Algebraic Descriptions	1: Arc Length	1: Relating Arc Length and Radius
					4: Calculating the Area of a Sector
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: Connecting Geometric and Algebraic Descriptions	2: Conic Sections	2: X^2 Plus Y^2 Equals $Radius^2$: Deriving the Equation for a Circle pp. M4-119A–M4-132
					3: A Blip on the Radar: Determining Points on a Circle pp. M4-133A–M4-148
		MATHia Software	4: Connecting Geometric and Algebraic Descriptions	4: Equation of a Circle	1: Deriving the Equation of a Circle
					2: Determining the Radius and Center of a Circle
G.GPE.2	Derive the equation of a parabola given a focus and directrix.	Textbook	4: Connecting Geometric and Algebraic Descriptions	2: Conic Sections	5: Going the Equidistance: Equation of a Parabola pp. M4-159–M4-186
G.GPE.3	(+) Derive the equations of ellipses and hyperbolas given the foci, using the fact that the sum or difference of distances from the foci is constant.	Textbook	4: Connecting Geometric and Algebraic Descriptions	2: Conic Sections	6: It's a Stretch: Ellipses pp. M4-187–M4-210
					7: More Asymptotes: Hyperbolas pp. M4-211–M4-228
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, √3) lies on the circle centered at the origin and containing the point (0, 2).	Textbook	1: Reasoning With Shapes	1: Using a Rectangular Coordinate System	4: Where Has Polly Gone?: Classifying Shapes on the Coordinate Plane pp. M1-51A–M1-68
			4: Connecting Geometric and Algebraic Descriptions	2: Conic Sections	3: A Blip on the Radar: Determining Points on a Circle pp. M4-133A–M4-148

Standard ID	Description	Location	Module	Topic (Textbook)/ Unit(MATHia Software)	Lesson (Textbook) / Workspace (MATHia Software)
G.GPE.5	Prove the slope criteria for parallel and perpendicular lines and use them to solve geometric problems (e.g., find the equation of a line parallel or perpendicular to a given line that passes through a given point).	Textbook	1: Reasoning With Shapes	1: Using a Rectangular Coordinate System	3: Ts and Train Tracks: Parallel and Perpendicular Lines pp. M1-33A–M1-50
					4: Where Has Polly Gone?: Classifying Shapes on the Coordinate Plane pp. M1-51A–M1-68
					5: In and Out and All About: Area and Perimeter on the Coordinate Plane pp. M1-69A–M1-96
		MATHia Software	1: Reasoning with Shapes	2: Parallel and Perpendicular Lines	1: Introduction to Parallel and Perpendicular Lines
					2: Modeling Parallel and Perpendicular Lines
G.GPE.6	Find the point on a directed line segment between two given points that partitions the segment in a given ratio.	Textbook	3: Investigating Proportionality	1: Similarity	6: Jack's Spare Key: Partitioning Segments in Given Ratios pp. M3-95A–M3-108
G.GPE.7	Use coordinates to compute perimeters of polygons and areas of triangles and rectangles, e.g., using the distance formula.*	Textbook	1: Reasoning With Shapes	1: Using a Rectangular Coordinate System	5: In and Out and All About: Area and Perimeter on the Coordinate Plane pp. M1-69A–M1-96
		MATHia Software	1: Reasoning with Shapes	3: Distances on the Coordinate Plane	1: Deriving the Distance Formula
					2: Calculating Distances using the Distance Formula
					3: Calculating Perimeter and Area Using the Distance Formula
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	4: Connecting Geometric and Algebraic Descriptions	1: Circles and Volume	1: All Circles Great and Small: Similarity Relationships in Circles pp. M4-7A–M4-24
					2: A Slice of Pi: Sectors and Segments of a Circle pp. M4-25A–M4-44
					3: Do Me a Solid: Building Three-Dimensional Figures pp. M4-45A–M4-64
					4: Get to the Point: Building Volume and Surface Area Formulas for Pyramids, Cones, and Spheres pp. M4-65A–M4-88

Standard ID	Description	Location	Module	Topic (Textbook)/ Unit(MATHia Software)	Lesson (Textbook) / Workspace (MATHia Software)
G.GMD.3	Use volume formulas for cylinders, pyramids, cones, and spheres to solve problems.*	Textbook	4: Connecting Geometric and Algebraic Descriptions	1: Circles and Volume	4: Get to the Point: Building Volume and Surface Area Formulas for Pyramids, Cones, and Spheres pp. M4-65A–M4-88
		MATHia Software	4: Connecting Geometric and Algebraic Descriptions	2: Volume	2: Calculating Volume of Cylinders
					3: Calculating Volume of Pyramids
					4: Calculating Volume of Cones
					5: Calculating Volume of Spheres
G.GMD.4	Identify the shapes of two-dimensional cross-sections of three dimensional objects, and identify three-dimensional objects generated by rotations of two-dimensional objects.	Textbook	4: Connecting Geometric and Algebraic Descriptions	1: Circles and Volume	3: Do Me a Solid: Building Three-Dimensional Figures pp. M4-45A–M4-64
				2: Conic Sections	1: Any Way You Slice It: Cross-Sections pp. M4-101A–M4-118
		MATHia Software	4: Connecting Geometric and Algebraic Descriptions	2: Volume	1: Creating Three-Dimensional Shapes from Two-Dimensional Figures
				3: Three-Dimensional Shapes	1: Visualizing Cross-Sections of Three-Dimensional Shapes
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	4: Connecting Geometric and Algebraic Descriptions	1: Circles and Volume	4: Get to the Point: Building Volume and Surface Area Formulas for Pyramids, Cones, and Spheres pp. M4-65A–M4-88
				2: Conic Sections	1: Any Way You Slice It: Cross-Sections pp. M4-101A–M4-118
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	1: Reasoning With Shapes	1: Using a Rectangular Coordinate System	5: In and Out and All About: Area and Perimeter on the Coordinate Plane pp. M1-69A–M1-96
			4: Connecting Geometric and Algebraic Descriptions	1: Circles and Volume	4: Get to the Point: Building Volume and Surface Area Formulas for Pyramids, Cones, and Spheres pp. M4-65A–M4-88
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	4: Connecting Geometric and Algebraic Descriptions	1: Circles and Volume	4: Get to the Point: Building Volume and Surface Area Formulas for Pyramids, Cones, and Spheres pp. M4-65A–M4-88
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

Standard ID	Description	Location	Module	Topic (Textbook)/ Unit(MATHia Software)	Lesson (Textbook) / Workspace (MATHia Software)
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
					4: And, Or, and More!: Calculating Compound Probability pp. M5-57A–M5-70
		MATHia Software	5: Making Informed Decisions	1: Independence and Conditional Probability	1: Independent Events
S.CP.3	Understand the conditional probability of *A* given *B* as P(*A* 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
		MATHia Software	5: Making Informed Decisions	2: Computing Probabilities	1: 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	2: Computing Probabilities	2: 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

Standard ID	Description	Location	Module	Topic (Textbook)/ Unit(MATHia Software)	Lesson (Textbook) / Workspace (MATHia Software)
S.CP.7	Apply the Addition Rule, P(*A* or *B*) = P(*A*) + P(*B*) – P(*A* 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	2: Computing Probabilities	3: Calculating Compound Probabilities
S.CP.8	(+) Apply the general Multiplication Rule in a uniform probability model, P(*A* 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
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. M5-149–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. M5-149–M5-164