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Course 3 Middle School Math Solution
Correlation to the 2017 North Carolina Standard Course of Study

Standard ID	Description	Location	Module	Topic (Textbook)/ Unit (MATHia Software)	Lesson (Textbook) / Workspace (MATHia Software)
NC.8.NS.1	Understand that every number has a decimal expansion. Building upon the definition of a rational number, know that an irrational number is defined as a non-repeating, non-terminating decimal.	Textbook	4: Expanding Number Systems	1: The Real Number System	1: So Many Numbers, So Little Time: Sorting Numbers pp. M4-7–M4-16
					2: Rational Decisions: Rational and Irrational Numbers pp. M4-17–M4-30
		MATHia Software	4: Expanding Number Systems	1: Rational and Irrational Numbers	1: Introduction to Irrational Numbers
					2: Graphing Real Numbers on a Number Line
					3: Ordering Rational and Irrational Numbers
NC.8.NS.2	Use rational approximations of irrational numbers to compare the size of irrational numbers and locate them approximately on a number line. Estimate the value of expressions involving: • Square roots and cube roots to the tenths. • □ to the hundredths.	Textbook	4: Expanding Number Systems	1: The Real Number System	3: What Are Those?!: The Real Numbers pp. M4-31–M4-45
		MATHia Software	4: Expanding Number Systems	1: Rational and Irrational Numbers	1: Introduction to Irrational Numbers
					2: Graphing Real Numbers on a Number Line
					3: Ordering Rational and Irrational Numbers
NC.8.EE.1	Develop and apply the properties of integer exponents to generate equivalent numerical expressions.	Textbook	5: Applying Powers	1: Exponents and Scientific Notation	1: It's a Generational Thing: Properties of Powers with Integer Exponents pp. M5-7–M5-28
					2: Show What You Know: Analyzing Properties of Powers pp. M5-29–M5-42
		MATHia Software	5: Applying Powers	1: Properties of Whole Number Exponents	1: Using the Product Rule and the Quotient Rule
					2: Using the Power to a Power Rule
					3: Using the Product to a Power and the Quotient to a Power Rule
					4: Using Properties of Exponents with Whole Number Exponents
					5: Simplifying Expressions with Negative and Zero Exponents

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NC.8.EE.2	Use square root and cube root symbols to: • Represent solutions to equations of the form $x^2 = p$ and $x^3 = p$, where p is a positive rational number. • Evaluate square roots of perfect squares and cube roots of perfect cubes for positive numbers less than or equal to 400.	Textbook	4: Expanding Number Systems	1: The Real Number System	3: What Are Those?!: The Real Numbers pp. M4-31–M4-45
				2: The Pythagorean Theorem	1: The Right Triangle Connection: The Pythagorean Theorem pp. M4-55–M4-74
					2: Can That Be Right?: The Converse of the Pythagorean Theorem pp. M4-75–M4-86
					3: Pythagoras Meets Descartes: Distances in a Coordinate System pp. M4-87–M4-98
					4: Catty Corner: Side Lengths in Two- and Three-Dimensions pp. M4-99–M4-112
		MATHia Software	4: Expanding Number Systems	1: Rational and Irrational Numbers	1: Introduction to Irrational Numbers
				2: The Pythagorean Theorem	2: Applying the Pythagorean Theorem
					3: Problem Solving Using the Pythagorean Theorem
					4: Calculating Distances on the Coordinate Plane
NC.8.EE.3	Use numbers expressed in scientific notation to estimate very large or very small quantities and to express how many times as much one is than the other.	Textbook	5: Applying Powers	1: Exponents and Scientific Notation	3: The Big and Small of It: Scientific Notation pp. M5-43–M5-60
					4: How Much Larger?: Operations with Scientific Notation pp. M5-61–M5-76
		MATHia Software	5: Applying Powers	2: Scientific Notation	2: Comparing Numbers using Scientific Notation
NC.8.EE.4	Perform multiplication and division with numbers expressed in scientific notation to solve real-world problems, including problems where both decimal and scientific notation are used.	Textbook	5: Applying Powers	1: Exponents and Scientific Notation	3: The Big and Small of It: Scientific Notation pp. M5-43–M5-60
					4: How Much Larger?: Operations with Scientific Notation pp. M5-61–M5-76
		MATHia Software	5: Applying Powers	2: Scientific Notation	1: Using Scientific Notation

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NC.8.EE.7	Solve real-world and mathematical problems by writing and solving equations and inequalities in one variable. • Recognize linear equations in one variable as having one solution, infinitely many solutions, or no solutions. • Solve linear equations and inequalities including multi-step equations and inequalities with the same variable on both sides.	Textbook	3: Modeling Linear Equations	1: Solving Linear Equations	1: Strategic Solving: Equations with Variables on Both Sides pp. M3-7–M3-16
					2: MP3s and DVDs: Analyzing and Solving Linear Equations pp. M3-17–M3-30
					3: Tic-Tac-Bingo: Creating Linear Equations pp. M3-31–M3-38
		MATHia Software	3: Modeling Linear Equations	2: Linear Equations with Variables on Both Sides	3: Solving Equations with One Solution, Infinite, and No Solutions
					4: Sorting Equations by Number of Solutions
				1: Solving Linear Equations	1: Exploring Two-Step Equations
					2: Solving Multi-Step Equations
				2: Linear Equations with Variables on Both Sides	1: Solving with Integers (No Type In)
					2: Solving with Integers (Type In)
NC.8.EE.8	Analyze and solve a system of two linear equations in two variables in slope-intercept form. • Understand that solutions to a system of two linear equations correspond to the points of intersection of their graphs because the point of intersection satisfies both equations simultaneously. • Solve real-world and mathematical problems leading to systems of linear equations by graphing the equations. Solve simple cases by inspection.	Textbook	3: Modeling Linear Equations	2: Systems of Linear Equations	1: Crossing Paths: Point of Intersection of Linear Graphs pp. M3-47–M3-60
					2: The Road Less Traveled: Systems of Linear Equations pp. M3-61–M3-74
					3: The County Fair: Using Substitution to Solve Linear Systems pp. M3-75–M3-92
					4: Rockin' Roller Rinks: Choosing a Method to Solve a Linear System pp. M3-93–M3-104
		MATHia Software	3: Modeling Linear Equations	3: Systems of Linear Equations	1: Modeling Linear Systems Involving Integers
					2: Modeling Linear Systems Involving Decimals
					3: Solving Linear Systems using Substitution
NC.8.F.1	Understand that a function is a rule that assigns to each input exactly one output. • Recognize functions when graphed as the set of ordered pairs consisting of an input and exactly one corresponding output. • Recognize functions given a table of values or a set of ordered pairs.	Textbook	2: Developing Function Foundations	3: Introduction to Functions	1: Patterns, Sequences, Rules . . .: Analyzing Sequences as Rules pp. M2-197–M2-188
					3: One or More Xs to One Y: Defining Functional Relationships pp. M2-205–M2-222
		MATHia Software	2: Developing Function Foundations	5: Relations and Functions	1: Exploring Functions
					2: Exploring Graphs of Functions
					3: Classifying Relations and Functions

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NC.8.F.2	Compare properties of two linear functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions).	Textbook	2: Developing Function Foundations	3: Introduction to Functions	5: Comparing Apples to Oranges: Comparing Functions Using Different Representations pp. M2-241–M2-256
NC.8.F.3	Identify linear functions from tables, equations, and graphs.	Textbook	2: Developing Function Foundations	3: Introduction to Functions	4: Over the River and Through the Woods: Describing Functions pp. M2-223–M2-240
		MATHia Software	2: Developing Function Foundations	2: Linear Models	1: Graphing Linear Relationships
NC.8.F.4	Analyze functions that model linear relationships. • Understand that a linear relationship can be generalized by $y = mx + b$. • Write an equation in slope-intercept form to model a linear relationship by determining the rate of change and the initial value, given at least two (x, y) values or a graph. • Construct a graph of a linear relationship given an equation in slope-intercept form. • Interpret the rate of change and initial value of a linear function in terms of the situation it models, and in terms of the slope and y-intercept of its graph or a table of values.	Textbook	2: Developing Function Foundations	1: From Proportions to Linear Relationships	2: Jack and Jill, Went Up the Hill: Using Similar Triangles to Describe the Steepness of a Line pp. M2-23–M2-42
				2: Linear Relationships	1: U.S. Shirts: Using Tables, Graphs, and Equations pp. M2-81–M2-92
					2: At the Arcade: Linear Relationships in Tables pp. M2-93–M2-108
					3: Dining, Dancing, and Driving: Linear Relationships in Contexts pp. M2-109–M2-118
					4: Derby Day: Slope-Intercept Form of a Line pp. M2-119–M2-134
					5: What's the Point?: Point-Slope Form of a Line pp. M2-135–M2-150
					6: The Arts Are Alive: Using Linear Equations pp. M2-151–M2-167
				3: Introduction to Functions	4: Over the River and Through the Woods: Describing Functions pp. M2-223–M2-240

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NC.8.F.4	Analyze functions that model linear relationships. • Understand that a linear relationship can be generalized by $y = mx + b$. • Write an equation in slope-intercept form to model a linear relationship by determining the rate of change and the initial value, given at least two (x, y) values or a graph. • Construct a graph of a linear relationship given an equation in slope-intercept form. • Interpret the rate of change and initial value of a linear function in terms of the situation it models, and in terms of the slope and y-intercept of its graph or a table of values.	MATHia Software	2: Developing Function Foundations	1: Linear Models and the Distributive Property	1: Modeling Integer Rates of Change
					2: Modeling Fractional Rates of Change
					3: Modeling using the Distributive Property over Division
				2: Linear Models	2: Graphing Given an Integer Slope and y-intercept
					3: Graphing Given a Decimal Slope and y-intercept
					4: Modeling Linear Equations in Standard Form
				3: Graphs of Linear Equations in Two Variables	1: Graphing Linear Equations using a Given Method
					2: Graphing Linear Equations using a Chosen Method
				4: Writing Equations of a Line	1: Modeling Given Slope and a Point
					2: Calculating Slopes
					3: Modeling Linear Equations Given Two Points
					4: Modeling Linear Equations Given an Initial Point
					5: Modeling LInear Functions using Multiple Representations
				5: Relations and Functions	4: Identifying Key Characteristics of Graphs of Functions
NC.8.F.5	Qualitatively analyze the functional relationship between two quantities. • Analyze a graph determining where the function is increasing or decreasing; linear or non-linear. • Sketch a graph that exhibits the qualitative features of a real-world function.	Textbook	2: Developing Function Foundations	3: Introduction to Functions	2: Once Upon a Graph: Analyzing the Characteristics of Graphs of Relationships pp. M2-189–M2-204
					4: Over the River and Through the Woods: Describing Functions pp. M2-223–M2-240

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NC.8.G.2	Use transformations to define congruence. • Verify experimentally the properties of rotations, reflections, and translations that create congruent figures. • Understand that a two-dimensional figure is congruent to another if the second can be obtained from the first by a sequence of rotations, reflections, and translations. • Given two congruent figures, describe a sequence that exhibits the congruence between them.	Textbook	1: Transforming Geometric Objects	1: Rigid Motion Transformations	1: Patty Paper, Patty Paper: Introduction to Congruent Figures pp. M1-7–M1-16
					2: Slides, Flips, and Spins: Introduction to Rigid Motions pp. M1-17–M1-38
					3: Lateral Moves: Translations of Figures on the Coordinate Plane pp. M1-39–M1-52
					4: Mirror, Mirror: Reflections of Figures on the Coordinate Plane pp. M1-53–M1-66
					5: Half Turns and Quarter Turns: Rotations of Figures on the Coordinate Plane pp. M1-67–M1-82
					6: Every Which Way: Combining Rigid Motions pp. M1-83–M1-97
			2: Developing Function Foundations	1: From Proportions to Linear Relationships	4: Up, Down, and All Around: Transformations of Lines pp. M2-53–M2-72
		MATHia Software	1: Transforming Geometric Objects	1: Transformations of Figures on the Coordinate Plane	1: Translating Plane Figures
					2: Reflecting Plane Figures
					3: Rotating Plane Figures
					5: Performing One Transformation
					6: Performing Multiple Transformations
NC.8.G.3	Describe the effect of dilations about the origin, translations, rotations about the origin in 90 degree increments, and reflections across the *x*-axis and *y*-axis on two-dimensional figures using coordinates.	Textbook	1: Transforming Geometric Objects	1: Rigid Motion Transformations	3: Lateral Moves: Translations of Figures on the Coordinate Plane pp. M1-39–M1-52

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NC.8.G.3	Describe the effect of dilations about the origin, translations, rotations about the origin in 90 degree increments, and reflections across the *x*-axis and *y*-axis on two-dimensional figures using coordinates.	Textbook	1: Transforming Geometric Objects	1: Rigid Motion Transformations	4: Mirror, Mirror: Reflections of Figures on the Coordinate Plane pp. M1-53–M1-66
					5: Half Turns and Quarter Turns: Rotations of Figures on the Coordinate Plane pp. M1-67–M1-82
					6: Every Which Way: Combining Rigid Motions pp. M1-83–M1-97
				2: Similarity	2: Rising, Running, Stepping, Scaling: Dilating Figures on the Coordinate Plane pp. M1-125–M1-140
		MATHia Software	1: Transforming Geometric Objects	1: Transformations of Figures on the Coordinate Plane	1: Translating Plane Figures
					2: Reflecting Plane Figures
					3: Rotating Plane Figures
					4: Dilating Plane Figures
					5: Performing One Transformation
					6: Performing Multiple Transformations
NC.8.G.4	Use transformations to define similarity. • Verify experimentally the properties of dilations that create similar figures. • Understand that a two-dimensional figure is similar to another if the second can be obtained from the first by a sequence of rotations, reflections, translations, and dilations. • Given two similar two-dimensional figures, describe a sequence that exhibits the similarity between them.	Textbook	1: Transforming Geometric Objects	2: Similarity	1: Pinch-Zoom Geometry: Dilations of Figures pp. M1-109–M1-124
					2: Rising, Running, Stepping, Scaling: Dilating Figures on the Coordinate Plane pp. M1-125–M1-140
					3: From Here to There: Mapping Similar Figures Using Transformations pp. M1-141–M1-157
		MATHia Software	1: Transforming Geometric Objects	1: Transformations of Figures on the Coordinate Plane	4: Dilating Plane Figures
					5: Performing One Transformation
					6: Performing Multiple Transformations

Standard ID	Description	Location	Module	Topic (Textbook)/ Unit (MATHia Software)	Lesson (Textbook) / Workspace (MATHia Software)
NC.8.G.5	Use informal arguments to analyze angle relationships. • Recognize relationships between interior and exterior angles of a triangle. • Recognize the relationships between the angles created when parallel lines are cut by a transversal. • Recognize the angle-angle criterion for similarity of triangles. • Solve real-world and mathematical problems involving angles.	Textbook	1: Transforming Geometric Objects	3: Line and Angle Relationships	1: Pulling a One-Eighty!: Triangle Sum and Exterior Angle Theorems pp. M1-167–M1-180
					2: Criss Cross Applesauce: Angle Relationships Formed by Lines Intersected by a Transversal pp. M1-181–M1-202
					3: The Vanishing Point: The Angle-Angle Similarity Theorem pp. M1-203–M1-212
		MATHia Software	1: Transforming Geometric Objects	2: Lines Cut by a Transversal	1: Classifying Angles Formed by Transversals
					2: Reasoning About Angles Formed by Transversals
					3: Calculating Angle Measures Formed by Transversals
NC.8.G.6	Explain the Pythagorean Theorem and its converse.	Textbook	4: Expanding Number Systems	2: The Pythagorean Theorem	1: The Right Triangle Connection: The Pythagorean Theorem pp. M4-55–M4-74
					2: Can That Be Right?: The Converse of the Pythagorean Theorem pp. M4-75–M4-86
		MATHia Software	4: Expanding Number Systems	2: The Pythagorean Theorem	1: Exploring the Pythagorean Theorem
NC.8.G.7	Apply the Pythagorean Theorem and its converse to solve real-world and mathematical problems.	Textbook	4: Expanding Number Systems	2: The Pythagorean Theorem	1: The Right Triangle Connection: The Pythagorean Theorem pp. M4-55–M4-74
					2: Can That Be Right?: The Converse of the Pythagorean Theorem pp. M4-75–M4-86
					4: Catty Corner: Side Lengths in Two- and Three-Dimensions pp. M4-99–M4-112
		MATHia Software	4: Expanding Number Systems	2: The Pythagorean Theorem	2: Applying the Pythagorean Theorem
					3: Problem Solving using the Pythagorean Theorem
NC.8.G.8	Apply the Pythagorean Theorem to find the distance between two points in a coordinate system.	Textbook	4: Expanding Number Systems	2: The Pythagorean Theorem	3: Pythagoras Meets Descartes: Distances in a Coordinate System pp. M4-87–M4-98
		MATHia Software	4: Expanding Number Systems	2: The Pythagorean Theorem	4: Calculating Distances on the Coordinate Plane

Standard ID	Description	Location	Module	Topic (Textbook)/ Unit (MATHia Software)	Lesson (Textbook) / Workspace (MATHia Software)
NC.8.G.9	Understand how the formulas for the volumes of cones, cylinders, and spheres are related and use the relationship to solve real-world and mathematical problems.	Textbook	5: Applying Powers	2: Volume of Curved Figures	1: Drum Roll, Please!: Volume of a Cylinder pp. M5-85–M5-98
					2: Cone of Silence: Volume of a Cone pp. M5-99–M5-112
					3: Pulled in All Directions: Volume of a Sphere pp. M5-113–M5-122
					4: Silos, Frozen Yogurt, and Popcorn: Volume Problems with Cylinders, Cones, and Spheres pp. M5-123–M5-132
		MATHia Software	5: Applying Powers	3: Volume	1: Calculating Volume of Cylinders
					2: Using Volume of Cylinders
					3: Calculating Volume of Cones
					4: Using Volume of Cones
					5: Calculating Volume of Spheres
					6: Using Volume of Spheres
NC.8.SP.1	Construct and interpret scatter plots for bivariate measurement data to investigate patterns of association between two quantities. Investigate and describe patterns such as clustering, outliers, positive or negative association, linear association, and nonlinear association.	Textbook	2: Developing Function Foundations	4: Patterns in Bivariate Data	1: Pass the Squeeze: Analyzing Patterns in Scatter Plots pp. M2-267–M2-288
		MATHia Software	2: Developing Function Foundations	6: Lines of Best Fit	1: Estimating LInes of Best Fit
NC.8.SP.2	Model the relationship between bivariate quantitative data to: • Informally fit a straight line for a scatter plot that suggests a linear association. • Informally assess the model fit by judging the closeness of the data points to the line.	Textbook	2: Developing Function Foundations	4: Patterns in Bivariate Data	2: Where Do You Buy Your Books?: Drawing Lines of Best Fit pp. M2-289–M2-304
					3: Mia Is Growing Like a Weed: Analyzing Lines of Best Fit pp. M2-305–M2-318
		MATHia Software	2: Developing Function Foundations	1: Lines of Best Fit	1: Estimating Lines of Best Fit
					2: Using Lines of Best Fit

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NC.8.SP.3	Use the equation of a linear model to solve problems in the context of bivariate quantitative data, interpreting the slope and *y*-intercept.	Textbook	2: Developing Function Foundations	4: Patterns in Bivariate Data	2: Where Do You Buy Your Books?: Drawing Lines of Best Fit pp. M2-289–M2-304
					3: Mia Is Growing Like a Weed: Analyzing Lines of Best Fit pp. M2-305–M2-318
					4: The Stroop Test: Comparing Slopes and Intercepts of Data from Experiments pp. M2-319–M2-328
		MATHia Software	2: Developing Function Foundations	1: Lines of Best Fit	2: Using Lines of Best Fit
NC.8.SP.4	Understand that patterns of association can also be seen in bivariate categorical data by displaying frequencies and relative frequencies in a two-way table. • Construct and interpret a two-way table summarizing data on two categorical variables collected from the same subjects. • Use relative frequencies calculated for rows or columns to describe possible association between the two variables.	Textbook	2: Developing Function Foundations	4: Patterns in Bivariate Data	5: Would You Rather ...?: Patterns of Association in Two-Way Tables pp. M2-329–M2-346