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Course 3 Middle School Math Solution

Correlation to the 2016 Mississippi College- and Career-Readiness Standards for Mathematics

CARNEGIE LEARNING

Standard ID	Description	Location	Module	Topic (Textbook)/ Unit(MATHia Software)	Lesson (Textbook) / Workspace (MATHia Software)
8.NS.1	Know that numbers that are not rational are called irrational. Understand informally that every number has a decimal expansion; for rational numbers show that the decimal expansion repeats eventually, and convert a decimal expansion which repeats eventually into a rational number.	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
8.NS.2	Use rational approximations of irrational numbers to compare the size of irrational numbers, locate them approximately on a number line diagram, and estimate the value of expressions (e.g., π^2).	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
8.EE.1	Know 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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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 small perfect squares and cube roots of small perfect cubes. Know that √2 is irrational.	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
8.EE.3	Use numbers expressed in the form of a single digit times an integer power of 10 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
8.EE.4	Perform operations with numbers expressed in scientific notation, including problems where both decimal and scientific notation are used. Use scientific notation and choose units of appropriate size for measurements of very large or very small quantities (e.g., use millimeters per year for seafloor spreading). Interpret scientific notation that has been generated by technology.	Textbook	5: Applying Powers	1: Exponents and Scientific Notation	3: The Big and Small of It: Scientific Notation pp. M5-43–M5-60

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8.EE.4	Perform operations with numbers expressed in scientific notation, including problems where both decimal and scientific notation are used. Use scientific notation and choose units of appropriate size for measurements of very large or very small quantities (e.g., use millimeters per year for seafloor spreading). Interpret scientific notation that has been generated by technology.	Textbook	5: Applying Powers	1: Exponents and Scientific Notation	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
8.EE.5	Graph proportional relationships, interpreting the unit rate as the slope of the graph. Compare two different proportional relationships represented in different ways.	Textbook	2: Developing Function Foundations	1: From Proportions to Linear Relationships	1: Post-Secondary Proportions: Representations of Proportional Relationships pp. M2-7–M2-22
					2: Jack and Jill, Went Up the Hill: Using Similar Triangles to Describe the Steepness of a Line pp. M2-23–M2-42
8.EE.6	Use similar triangles to explain why the slope m is the same between any two distinct points on a non-vertical line in the coordinate plane; derive the equation $y=mx$ for a line through the origin and the equation $y=mx+b$ for a line intercepting the vertical axis at b.	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
					3: Slippery Slopes: Exploring Slopes Using Similar Triangles pp. M2-43–M2-52
					4: Up, Down, and All Around: Transformations of Lines pp. M2-53–M2-72
8.EE.7	Solve linear equations in one variable.	Textbook	3: Modeling Linear Equations	1: Solving Linear Equations	3: Tic-Tac-Bingo: Creating Linear Equations pp. M3-31–M3-38
8.EE.7a	Give examples of linear equations in one variable with one solution, infinitely many solutions, or no solutions. Show which of these possibilities is the case by successively transforming the given equation into simpler forms, until an equivalent equation of the form $x=a$, $a=a$, or $a=b$ results (where a and b are different numbers).	Textbook	3: Modeling Linear Equations	1: Solving Linear Equations	2: MP3s and DVDs: Analyzing and Solving Linear Equations pp. M3-17–M3-30

Standard ID	Description	Location	Module	Topic (Textbook)/ Unit(MATHia Software)	Lesson (Textbook) / Workspace (MATHia Software)
8.EE.7a	Give examples of linear equations in one variable with one solution, infinitely many solutions, or no solutions. Show which of these possibilities is the case by successively transforming the given equation into simpler forms, until an equivalent equation of the form x = a, a = a, or a = b results (where a and b are different numbers).	Textbook	3: Modeling Linear Equations	1: Solving Linear Equations	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
8.EE.7b	Solve linear equations with rational number coefficients, including equations whose solutions require expanding expressions using the distributive property and collecting like terms.	Textbook	3: Modeling Linear Equations	1: Solving Linear Equations	1: Strategic Solving: Equations with Variables on Both Sides pp. M3-7–M3-16
					3: Tic-Tac-Bingo: Creating Linear Equations pp. M3-31–M3-38
		MATHia Software	3: Modeling Linear Equations	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)
8.EE.8	Analyze and solve pairs of simultaneous linear equations.	Textbook	3: Modeling Linear Equations	2: Systems of Linear Equations	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
8.EE.8a	Understand that solutions to a system of two linear equations in two variables correspond to points of intersection of their graphs, because points of intersection satisfy both equations simultaneously.	Textbook	3: Modeling Linear Equations	2: Systems of Linear Equations	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

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8.EE.8b	Solve systems of two linear equations in two variables algebraically, and estimate solutions by graphing the equations. Solve simple cases by inspection.	Textbook	3: Modeling Linear Equations	2: Systems of Linear Equations	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
8.EE.8c	Solve real-world and mathematical problems leading to two linear equations in two variables	Textbook	3: Modeling Linear Equations	2: Systems of Linear Equations	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
8.F.1	Understand that a function is a rule that assigns to each input exactly one output. The graph of a function is the set of ordered pairs consisting of an input and the corresponding output.	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 Functional Foundations	5: Relations and Functions	1: Exploring Functions
					2: Exploring Graphs of Functions
					3: Classifying Relations and Functions
8.F.2	Compare properties of two 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
8.F.3	Interpret the equation y = mx + b as defining a linear function, whose graph is a straight line; give examples of functions that are not linear.	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 Functional Foundations	2: Linear Models	1: Graphing Linear Relationships

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8.F.4	Construct a function to model a linear relationship between two quantities. Determine the rate of change and initial value of the function from a description of a relationship or from two (x, y) values, including reading these from a table or from a graph. Interpret the rate of change and initial value of a linear function in terms of the situation it models, and in terms of its graph or a table of values.	Textbook	2: Developing Function Foundations	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
		MATHia Software	2: Developing Functional Foundations	1: Linear Models and the Distributive Property	1: Modeling Integer Rates of Change
					1: Modeling Integer 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

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8.F.5	Construct a function to model a linear relationship between two quantities. Determine the rate of change and initial value of the function from a description of a relationship or from two (x, y) values, including reading these from a table or from a graph. Interpret the rate of change and initial value of a linear function in terms of the situation it models, and in terms of its graph or a table of values.	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
		MATHia Software	2: Developing Functional Foundations	4: Writing Equations of a Line	5: Modeling LInear Functions using Multiple Representations
				5: Relations and Functions	4: Identifying Key Characteristics of Graphs of Functions
8.G.1	Verify experimentally the properties of rotations, reflections, and translations.	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
			2: Developing Function Foundations	1: From Proportions to Linear Relationships	4: Up, Down, and All Around: Transformations of Lines pp. M2-53–M2-72
8.G.2	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

Standard ID	Description	Location	Module	Topic (Textbook)/ Unit(MATHia Software)	Lesson (Textbook) / Workspace (MATHia Software)
8.G.2	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.	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
8.G.3	Describe the effect of dilations, translations, rotations, and reflections 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
					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
8.G.4	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

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8.G.5	Use informal arguments to establish facts about the angle sum and exterior angle of triangles, about the angles created when parallel lines are cut by a transversal, and the angle-angle criterion for similarity of triangles.	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: Crisscross 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
8.G.6	Explain a proof of 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
8.G.7	Apply the Pythagorean Theorem to determine unknown side lengths in right triangles in real-world and mathematical problems in two and three dimensions.	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
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)
8.G.9	Know the formulas for the volumes of cones, cylinders, and spheres and use them 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
8.SP.1	Construct and interpret scatter plots for bivariate measurement data to investigate patterns of association between two quantities. 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 Functional Foundations	6: Lines of Best Fit	1: Estimating LInes of Best Fit
8.SP.2	Know that straight lines are widely used to model relationships between two quantitative variables. For scatter plots that suggest a linear association, informally fit a straight line, and 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 Functional Foundations	1: Lines of Best Fit	1: Estimating Lines of Best Fit
8.SP.3	Use the equation of a linear model to solve problems in the context of bivariate measurement data, interpreting the slope and 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

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8.SP.3	Use the equation of a linear model to solve problems in the context of bivariate measurement data, interpreting the slope and intercept. For example, in a linear model for a biology experiment, interpret a slope of 1.5 cm/hr as meaning that an additional hour of sunlight each day is associated with an additional 1.5 cm in mature plant height.	MATHia Software	2: Developing Functional Foundations	1: Lines of Best Fit	2: Using Lines of Best Fit
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