Tennessee Math Grade 6

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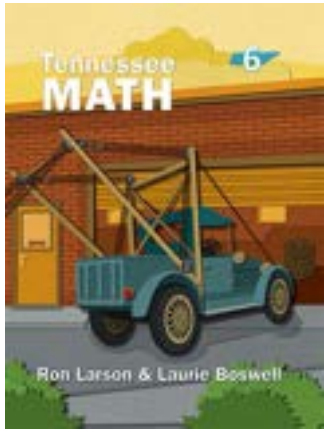
By Ron Larson and Laurie Boswell

Correlated to the Tennessee Mathematics Standards



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Erie, Pennsylvania
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Standard		Tennessee Math Grade 6
	Grade 6	
	Ratios and Proportional Relationships (RP)	
A. Understand ratio concepts and use ratio reasoning to solveproblems.	**6.RP.A.1** Understand the concept of a ratio and use ratio language to describe a ratio relationship between two quantities. Make a distinction between ratios and fractions. *Forexample, the ratio of wings to beaks in a bird house at the zoo was 2:1, because for every 2 wings there was 1 beak. Another example could be for every vote candidate A received,candidate C received nearly three votes.*	3.1, 3.2, 3.3, 3.4
	6.RP.A.2 Understand the concept of a unit rate *a/b* associatedwith a ratio $a:b$ with $b \neq 0$. Use rate language in the context ofa ratio relationship. *For example, this recipe has a ratio of 3 cups of flour to 4 cups of sugar, so there is* $3/4$ *cup of flour for each cup of sugar. Also, we paid $75 for 15 hamburgers, whichis a rate of $5 per hamburger.* (Expectations for unit rates in 6th grade are limited to non-complex fractions).	3.5
	6.RP.A.3 Use ratio and rate reasoning to solve real-world and mathematical problems (*e.g., by reasoning about tables of equivalent ratios, tape diagrams, double number line diagrams, or equations*).	3.1, 3.2, 3.3, 3.4, 3.5, 3.6, 4.4
	a. Make tables of equivalent ratios relating quantities with whole number measurements, find missing values in the tables, and plot the pairs of values on the coordinate plane. Usetables to compare ratios.	3.3, 3.4, 3.5
	b. Solve unit rate problems including those involving unit pricing and constant speed. *For example, if a runner ran 10 miles in 90 minutes, running at that speed, how long will it takehim to run 6 miles? How fast is he running in miles per hour?*	3.5
	c. Find a percent of a quantity as a rate per 100 (*e.g., 30% of a quantity means* $30/100$ *times the quantity*); solve problems involving finding the whole, given a part and the percent.	4.1, 4.2, 4.4

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	d. Use ratio reasoning to convert customary and metric measurement units (within the same system); manipulate and transform units appropriately when multiplying or dividing quantities.	3.6
	The Number System (NS)	
A. Apply and extend previous understandings of multiplication and divisionto divide fractions by fractions.	**6.NS.A.1** Interpret and compute quotients of fractions, andsolve real-world and mathematical problems involving division of fractions by fractions (*e.g., connecting visual fraction modelsand equations to represent the problem is suggested*). *For example, create a story context for* $(2/3) \div (3/4)$ *and use a visual fraction model to show the quotient; use the relationship between multiplication and division to explain that* $(2/3) \div (3/4) = 8/9$ *because* $3/4$ *times* $8/9$ *is* $2/3$ $((a/b) \div (c/d) = ad/bc)$. *Further example: How much chocolate will each person get if 3 people share 1/2 lb of chocolate equally? How wide is a rectangular strip of land with length 3/4 mi and area 1/2 square mi?*	2.1, 2.2, 2.3
B. Compute fluently with multi-digit numbers and find common factors and multiples.	**6.NS.B.2** Fluently divide multi-digit numbers using a standard algorithm.	2.6
	6.NS.B.3 Fluently add, subtract, multiply, and divide multi-digit decimals using a standard algorithm and making connections to previous conceptual work with each operation.	2.4, 2.5, 2.7
	6.NS.B.4 Find the greatest common factor of two whole numbers less than or equal to 100 and the least common multiple of two whole numbers less than or equal to 12. Use the distributive property to express a sum of two wholenumbers 1–100 with a common factor as a multiple of a sum oftwo whole numbers with no common factor. *For example, express* $36 + 8$ *as* $4(9 + 2)$.	1.3, 1.4, 1.5, 5.5
C. Apply and extend previous understandingsof numbers to the system of rational numbers.	**6.NS.C.5** Understand that positive and negative numbers are used together to describe quantities having opposite directionsor values (*e.g., temperature above/below zero, elevationabove/below sea level, credits/debits, positive/negative electriccharge*); use positive and negative numbers to represent quantities in real- world contexts, explaining the meaning of 0 ineach situation as well as describing situations in which oppositequantities can combine to make 0.	8.1, 8.3

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	6.NS.C.6 Understand a rational number as a point on the number line. Extend number line diagrams and coordinate axesfamiliar from previous grades to represent points on the line andin the plane with negative number coordinates.	
	a. Recognize opposite signs of numbers as indicating locations on opposite sides of 0 on the number line; recognize that the opposite of the opposite of a number is the number itself. *For example,* $-(-3) = 3$*, and that 0 is its own opposite.*	8.1, 8.3
	b. Understand signs of numbers in ordered pairs as indicating locations in quadrants of the coordinate plane; recognize that when two ordered pairs differ only by signs, the locations of thepoints are related by reflections across one or both axes.	8.5
	c. Find and position integers and other rational numbers on a horizontal or vertical number line diagram; find and position pairs of integers and other rational numbers on a coordinate plane.	8.1, 8.2, 8.3, 8.5
	6.NS.C.7 Understand ordering and absolute value of rational numbers.	
	a. Interpret statements of inequality as statements about the relative position of two numbers on a number line diagram. *For example, interpret* $-3 > -7$ *as a statement that* -3 *is located to the right of* -7 *on a number line oriented from left to right.*	4.1, 4.2, 4.3, 8.2, 8.3
	b. Write, interpret, and explain statements of order for rationalnumbers in real-world contexts. *For example, write* $-3º\ C > -7º\ C$ *to express the fact that* $-3º\ C$ *is warmer than* $-7º\ C$*.*	4.1, 4.2, 4.3, 8.2, 8.3
	c. Understand the absolute value of a rational number as its distance from 0 on the number line and distinguish comparisonsof absolute value from statements about order in a real-world context. *For example, an account balance of -24 dollars represents a greater debt than an account balance* -14 *dollars because* -24 *is located to the left of* -14 *on the number line.*	8.4

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	6.NS.C.8 Solve real-world and mathematical problems by graphing points in all four quadrants of the coordinate plane. Include use of coordinates and absolute value to find distances between points with the same first coordinate or the same second coordinate.	8.5, 8.6
	Expressions and Equations (EE)	
A. Apply and extend previous understandings of arithmetic to algebraic expressions.	**6.EE.A.1** Write and evaluate numerical expressions involving whole-number exponents.	1.1, 1.2
	6.EE.A.2 Write, read, and evaluate expressions in which variables stand for numbers.	
	a. Write expressions that record operations with numbers and with variables. *For example, express the calculation "Subtract y from 5" as* $5 - y$.	5.2
	b. Identify parts of an expression using mathematical terms (sum, term, product, factor, quotient, coefficient); view one or more parts of an expression as a single entity. *For example, describe the expression* $2\ (8 + 7)$ *as a product of two factors; view* $(8 + 7)$ *as both a single entity and a sum of two terms.*	5.1, 5.4, 5.5
	c. Evaluate expressions at specific values of their variables. Include expressions that arise from formulas used in real-world problems. Perform arithmetic operations, including those involving whole number exponents, in the conventional order when there are no parentheses to specify a particular order (Order of Operations).	5.1, 7.1, 7.2, 7.3
	6.EE.A.3 Apply the properties of operations (including, but not limited to, commutative, associative, and distributive properties) to generate equivalent expressions. (The distributive property of multiplication over addition is prominent here. Negative coefficients are not an expectation at this grade level.) *For example, apply the distributive property to the expression* $3\ (2 + x)$ *to produce the equivalent expression* $6 + 3x$*; apply the distributive property to the expression* $24x + 18y$ *to produce the equivalent expression* $6\ (4x + 3y)$*; apply properties of operations to* $y + y + y$ *to produce the equivalent expression* $3y$.	5.3, 5.4, 5.5

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	6.EE.A.4 Identify when expressions are equivalent (i.e., when the expressions name the same number regardless of which value is substituted into them). *For example, the expression* $5b + 3b$ *isequivalent to* $(5 + 3)\, b$*, which is equivalent to* $8b$*.*	5.3, 5.4, 5.5
B. Reason about and solve one-variable equations and inequalities.	**6.EE.B.5** Understand that a solution to an equation or inequalityis the value(s) that makes that statement true. Use substitutionto determine whether a given number in a specified set makes an equation or inequality true.	6.1, 6.2, 6.3, 8.7, 8.8
	6.EE.B.6 Use variables to represent numbers and write expressions when solving real-world and mathematical problems; understand that a variable can represent an unknown number, or, depending on the purpose at hand, any number in a specified set.	6.1, 6.2, 6.3, 6.4, 8.7, 8.8
	6.EE.B.7 Solve real-world and mathematical problems by writing and solving one- step equations of the form $x + p = q$, $px = q$, $x - p = q$, *and* $x/p = q$ for cases in which p, q, and x are all nonnegative rational numbers and $p \neq 0$. (Complex fractions arenot an expectation at this grade level.)	6.1, 6.2, 6.3
	6.EE.B.8 Interpret and write an inequality of the form $x > c$, $x < c$, $x \leq c$, *or* $x \geq c$ which represents a condition or constraint in a real-world or mathematical problem. Recognize that inequalities have infinitely many solutions; represent solutions of inequalities on number line diagrams.	8.7, 8.8
C. Represent and analyzequantitative relationships between dependent and independent variables.	**6.EE.C.9** Use variables to represent two quantities in a real- world problem that change in relationship to one another. *For example, Susan is putting money in her savings account by depositing a set amount each week ($50). Represent her savings account balance with respect to the number of weekly deposits* $(s = 50w$*, illustrating the relationship between balance amount sand number of weeks w).*	6.4
	a. Write an equation in the form of $y = px$ where y, p, and x are all non-negative and $p \neq 0$, to express one quantity, thought of as the dependent variable, in terms of the other quantity, thought of as the independent variable.	6.4

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	b. Analyze the relationship between the dependent and independent variables using graphs and tables, and relate theseto the equation.	6.4
	Geometry (G)	
A. Solve real-world and mathematical problemsinvolving area, surfacearea, and volume.	**6.G.A.1** Find the area of right triangles, other triangles, special quadrilaterals, and polygons by composing into rectangles or decomposing into triangles and other shapes; know and apply these techniques in the context of solving real-world and mathematical problems.	7.1, 7.2, 7.3
	6.G.A.2 Find the volume of a right rectangular prism with fractional edge lengths by packing it with unit cubes of the appropriate unit fraction edge lengths, and show that the volume is the same as would be found by multiplying the edge lengths of the prism. Apply the formulas $V = lwh$ and $V = Bh$ where B is the area of the base to find volumes of right rectangular prisms with fractional edge lengths in the context ofsolving real-world and mathematical problems.	7.7
	6.G.A.3 Draw polygons in the coordinate plane given coordinates for the vertices; use coordinates to find the length of a side that joins two vertices (vertical or horizontal segmentsonly). Apply these techniques in the context of solving real- world and mathematical problems.	8.6
	6.G.A.4 Represent three-dimensional figures using nets made up of rectangles and triangles, and use the nets to find the surface area of these figures. Apply these techniques in the context of solving real-world and mathematical problems.	7.4, 7.5, 7.6
	Statistics and Probability (SP)	
A. Develop understandingof statistical variability.	**6.SP.A.1** Recognize a statistical question as one that anticipates variability in the data related to the question and accounts for itin the answers. *For example, "How old am I?" is not a statisticalquestion, but "How old are the students in my school?" is a statistical question because one anticipates variability in students' ages.*	9.1

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	6.SP.A.2 Understand that a set of data collected to answer a statistical question has a distribution which can be described byits measures of center (mean, median, mode), measures ofvariation (range only), and overall shape.	9.1, 9.2, 9.3, 10.1, 10.4, 10.5, 10.6
	6.SP.A.3 Recognize that a measure of center (mean, median, mode) for a numerical data set summarizes all of its values witha single number, while a measure of variation describes how itsvalues vary with a single number.	9.2, 9.3
B. Summarize and describe distributions.	**6.SP.B.4** Display a single set of numerical data using dot plots(line plots), box plots, pie charts and stem plots.	9.1, 10.1, 10.2, 10.4, 10.6
	6.SP.B.5 Summarize numerical data sets in relation to theircontext.	
	a. Report the number of observations.	9.1, 9.2
	b. Describe the nature of the attribute under investigation,including how it was measured and its units of measurement.	9.1
	c. Give quantitative measures of center (median and/or mean) and variability (range) as well as describing any overall pattern with reference to the context in which the data were gathered.	9.2, 9.3, 10.6
	d. Relate the choice of measures of center to the shape of thedata distribution and the context in which the data were gathered.	10.3, 10.5

Tennessee Math Grade 7

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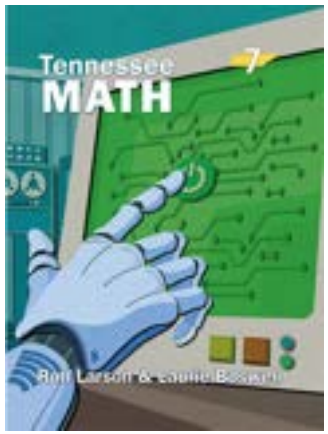

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	Grade 7	
	Ratios and Proportional Relationships (RP)	
A. Analyze proportional relationships and use them to solve real-world and mathematical problems.	**7.RP.A.1** Compute unit rates associated with ratios of fractions, including ratios of lengths, areas, and other quantities measured in like or different units. *For example, if a person walks* $1/2$ *mile in each 15 minutes, compute the unit rate as thecomplex fraction* $(1/2)$ / $(1/4)$ *miles per hour, equivalently 2 miles per hour.*	5.1, 5.2
	7.RP.A.2 Recognize and represent proportional relationships between quantities.	
	a. Decide whether two quantities are in a proportional relationship (*e.g., by testing for equivalent ratios in a table or graphing on a coordinate plane and observing whether the graph is a straight line through the origin*).	5.3, 5.5
	b. Identify the constant of proportionality (unit rate) in tables,graphs, equations, diagrams, and verbal descriptions of proportional relationships.	5.2, 5.3, 5.5
	c. Use the concept of equality to represent proportional relationships with equations. *For example, if total cost t is proportional to the number n of items purchased at a constantprice p, the relationship between the total cost and the numberof items can be expressed as* $t = pn$.	5.5
	d. Explain what a point *(x, y)* on the graph of a proportional relationship means in terms of the situation, with special attention to the points (0, 0) and (1, *r)* where *r* is the unit rate.	5.5
	7.RP.A.3 Use proportional relationships to solve multi-stepratio and percent problems. *Examples: batting averages, recipes, simple interest, tax, markups and markdowns, gratuities and commissions, fees, percent increase and decrease, percent error, etc.*	5.1, 5.2, 5.4, 6.2, 6.3, 6.4, 6.5, 6.6

Standard		Tennessee Math Grade 7
	The Number System (NS)	
A. Apply and extend previous understandings of operations with fractions to add, subtract, multiply, and divide rational numbers.	**7.NS.A.1** Apply and extend previous understandings of addition and subtraction to add and subtract rational numbers;represent addition and subtraction on a horizontal or vertical number line diagram.	1.1, 1.2, 1.3
	a. Understand $p + q$ as the number located a distance $\|q\|$ from*p*, in the positive or negative direction depending on whether q is positive or negative. Show that a number and its opposite have a sum of 0 (are additive inverses). Interpret sums of rational numbers by describing real- world contexts.	1.2, 1.3
	b. Understand subtraction of rational numbers as adding the additive inverse, $p - q = p + (-q)$. Show that the distance between two rational numbers on the number line is the absolute value of their difference, and apply this principle in real-world contexts.	1.4, 1.5
	c. Apply properties of operations as strategies to add and subtract rational numbers.	1.2, 1.3, 1.5
	7.NS.A.2 Apply and extend previous understandings of multiplication and division and of fractions to multiply and divide rational numbers.	
	a. Understand that multiplication is extended from fractions to all rational numbers by requiring that operations continue to satisfy the properties of operations, particularly the distributive property, leading to products such as $(-1)(-1) = 1$ and the rules for multiplying signed numbers. Interpret products of rational numbers by describing real-world contexts.	2.1, 2.4
	b. Understand that integers can be divided, provided that the divisor is not zero, and every quotient of integers (with non- zero divisor) is a rational number. If p and q are integers, then $-(p/q) = (-p)/q = p/(-q)$. Interpret quotients of rational numbers by describing real-world contexts.	2.2, 2.3, 2.5
	c. Apply properties of operations as strategies to multiply and divide rational numbers.	2.1, 2.4
	d. Convert a rational number to a decimal using long division; know that the decimal form of a rational number terminates oreventually repeats.	2.3

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	7.NS.A.3 Solve real-world and mathematical problems involving the four operations with rational numbers.(Computations with rational numbers extend the rules for manipulating fractions to complex fractions.)	1.1, 1.2, 1.3, 1.4, 1.5, 2.1, 2.2, 2.4, 2.5
	Expressions and Equations (EE)	
A. Use properties of operations to generate equivalent expressions.	**7.EE.A.1** Apply properties of operations as strategies to add, subtract, factor, and expand linear expressions with rational coefficients.	3.1, 3.2, 3.3, 3.4
	7.EE.A.2 Rewrite and connect equivalent expressions indifferent forms in a contextual problem to provide multiple ways of interpreting the problem and investigating how the quantities in it are related. *For example, shoes are on sale at a25% discount. How is the discounted price P related to the original cost C of the shoes? $C - 0.25C = P$. In other words, P is 75% of the original cost since $C - 0.25C$ can be written as $0.75C$.*	3.1, 3.2, 3.3, 3.4
B. Solve real-world andmathematical problemsusing numerical and algebraic expressions and equations and inequalities.	**7.EE.B.3** Solve multi-step real-world and mathematical problems posed with positive and negative rational numberspresented in any form (whole numbers, fractions, and decimals).	6.1, 6.2, 6.3, 6.4, 6.5, 6.6
	a. Apply properties of operations to calculate with numbers in any form; convert between forms as appropriate.	6.1, 6.2, 6.3, 6.4, 6.5, 6.6
	b. Assess the reasonableness of answers using mental computation and estimation strategies.	6.2, 6.3, 6.4, 6.5
	7.EE.B.4 Use variables to represent quantities in a real-world and mathematical problem, and construct simple equations and inequalities to solve problems by reasoning about the quantities.	
	a. Solve real-world and mathematical problems leading to equations of the form $px + q = r$ and $p(x + q) = r$ where p, q, and$r$ are specific rational numbers. Solve equations of these formsfluently. Compare an algebraic solution to an arithmetic solution, identifying the sequence of the operations used in each approach. *For example, the perimeter of a rectangle is 54cm. Its length is 6 cm. What is its width?*	4.1, 4.2, 4.3

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	b. Solve real-world and mathematical problems leading toinequalities of the form $px + q > r$, $px + q < r$, $px + q \geq r$, and $px + q \leq r$, where p, q, and r are specific rational numbers. Graph the solution set of the inequality on a number line and interpretit in the context of the problem. *For example: As a salesperson,you are paid $50 per week plus $3 per sale. This week you wantyour pay to be at least$100. Write an inequality for the numberof sales you need to make, and describe the solutions.*	4.4, 4.5, 4.6, 4.7
	Geometry (G)	
A. Draw, construct, anddescribe geometricalfigures and describe the relationships between them.	**7.G.A.1** Solve problems involving scale drawings of congruent and similar geometric figures, including computing actual lengths and areas from a scale drawing and reproducing a scaledrawing at a different scale.	5.6
	7.G.A.2 Draw triangles with given conditions: three angle measures or three side measures. Notice when the conditions determine a unique triangle, more than one triangle, or no triangle.	9.4
B. Solve real-world and mathematical problemsinvolving angle measure, area, surface area, andvolume.	**7.G.B.3** Know the formulas for the area and circumference of acircle and use them to solve problems. Explore the relationships between the radius, the circumference, and the area of a circle, and the number π.	9.1, 9.2, 9.3, 10.2
	7.G.B.4 Know and use facts about supplementary, complementary, vertical, and adjacent angles in a multi-step problem to write and solve simple equations for an unknown angle in a figure.	9.5
	7.G.B. 5 Solve real-world and mathematical problemsinvolving area of two-dimensional figures composed of triangles, quadrilaterals, and polygons, and volume and surface area of three-dimensional objects composed of cubes and right prisms.	9.3, 10.1, 10.3, 10.4, 10.5, 10.6

Standard		Tennessee Math Grade 7
	Statistics and Probability (SP)	
A. Use random sampling to draw inferences about a population.	**7.SP.A.1** Explore how statistics can be used to gain informationabout a population by examining a sample of the population; generalizations about a population from a sample are valid onlyif the sample is representative of that population. Understand that random sampling tends to produce representative samples and support valid inferences.	8.1
	7.SP.A.2 Collect and use data from a random sample to draw inferences about a population with an unknown characteristicof interest. Generate multiple samples (or simulated samples) of the same size to gauge the variation in estimates or predictions. *For example, estimate the mean word length in a book by randomly sampling words from the book; predict the winner of a school election based on randomly sampled survey data. Gauge how far off the estimate or prediction might be.*	8.1, 8.2, 8.4
B. Draw informal comparative inferences about two populations.	**7.SP.B.3** Informally compare the measures of center (mean, median, mode) of two numerical data distributions with similar variabilities. *For example, the mean height of players on the basketball team is 10 cm greater than the mean height of players on the soccer team; on a dot plot or box plot, the separation between the two distributions of heights is noticeable.*	8.3
	7.SP.B.4 Use measures of center and measures of variability for numerical data from random samples to draw informal comparative inferences about two populations. *For example, decide whether the words in a chapter of a 7th grade science book are generally longer than the words in a chapter of a 4th grade science book.*	8.4
C. Investigate chance processes and develop, use, and evaluate probability models.	**7.SP.C.5** Recognize that the probability of a chance event is a number between 0 and 1 and interpret the likelihood of the event occurring.	7.1
	7.SP.C.6 Calculate theoretical and experimental probability ofsimple events.	7.2

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	a. Approximate the probability of a chance event by collectingdata on the chance process that produces it and observing its long-run relative frequency, and predict the approximate relative frequency given the probability.	7.1, 7.2
	b. Calculate the theoretical probability of a simple event.	7.2
	c. Compare theoretical probabilities to experimental probabilities; explain any possible sources of discrepancy. *For example, when rolling a number cube 600 times, predict that a3 or 6 would be rolled roughly 200 times, but probably not exactly 200 times.*	7.2
	7.SP.C.7 Develop a probability model and use it to findexperimental or theoretical probabilities of events.	7.2
	a. Use a uniform probability model, with equal probability assigned to all outcomes, to determine probabilities of events. *For example, if a student is selected at random from a class, find the probability that Jane will be selected and the probability that a girl will be selected.*	7.2
	b. Develop a probability model, including non-uniform models,by observing frequencies in data generated from a chance process. Use the model to estimate the probabilities of events. *For example, find the approximate probability that a spinning penny will land heads up or that a tossed paper cup will land open end down. Do the outcomes for the spinning penny appear to be equally likely based on the observed frequencies?*	7.1, 7.2
D. Summarize and describenumerical data sets.	**7.SP.D.8** Summarize a numerical data set in relation to itscontext.	
	a. Give quantitative measures of center (median and/or mean)and variability (range and/or interquartile range), as well as describe any overall pattern and any striking deviations from the overall pattern with reference to the context in which the data were gathered.	7.3, 7.4, 7.6

Standard		Tennessee Math Grade 7
	b. Relate and understand the choice of measures of center (median and/or mean) and variability (range and/or interquartile range) to the shape of the data distribution and the context in which the data were gathered.	7.5

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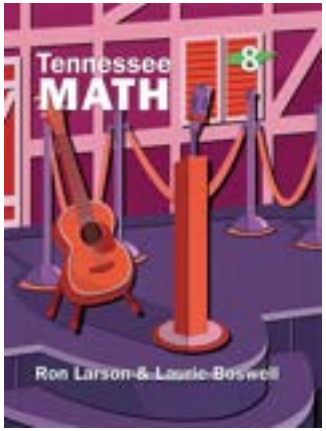

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Standard		Tennessee Math Grade 8
	Grade 8	
	The Number System (NS)	
A. Know that there arenumbers that are not rational, and approximatethem by rational numbers.	**8.NS.A.1** Know that real numbers that are not rational are called irrational (*e.g.,* π, $\sqrt{2}$, *etc.*). Understand informally that every number has a decimal expansion; for rational numbers show that the decimal expansion repeats eventually or terminates, and convert a decimal expansion which repeats eventually or terminates into a rational number.	8.4, 8.5
	8.NS.A.2 Use rational approximations of irrational numbers to compare the size of irrational numbers by locating them approximately on a number line diagram. Estimate the value ofirrational expressions (such as π^2). *For example, by truncating the decimal expansion of* $\sqrt{2}$*, show that* $\sqrt{2}$ *is between 1 and 2, then between 1.4 and 1.5, and explain how to continue on to get better approximations.*	8.5
	Expressions and Equations (EE)	
A. Work with radicals andinteger exponents.	**8.EE.A.1** Know and apply the properties of integer exponents to generate equivalent numerical expressions. *For example,* $3^2 \times 3^{-5} = 3^{-3} = 1/3^3 = 1/27$.	7.1, 7.2, 7.3, 7.4
	8.EE.A.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.	8.1, 8.2, 8.3
	8.EE.A.3 Use numbers expressed in the form of a single digit times an integer power of 10 to estimate very large or very smallquantities and to express how many times as much one is than the other. *For example, estimate the population of the United States as* 3×10^8 *and the population of the world as* 7×10^9*, anddetermine that the world population is more than 20 times larger.*	7.5, 7.6

Standard		Tennessee Math Grade 8
	8.EE.A.4 Using technology, solve real-world problems with numbers expressed in decimal and scientific notation. 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*).	7.6, 7.7
B. Understand the connections between proportional relationships,lines, and linear equations.	**8.EE.B.5** Graph proportional relationships, interpreting the unitrate as the slope of the graph. Compare two different proportional relationships represented in different ways. *For example, compare a distance-time graph to a distance-time equation to determine which of two moving objects has greaterspeed.*	4.1, 4.3
	8.EE.B.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; know and apply 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.	4.2, 4.3, 4.4, 4.5
C. Analyze and solve linear equations, linear inequalities, and systems oftwo linear equations.	**8.EE.C.7** Solve linear equations in one variable.	1.1, 1.2, 1.3, 1.4
	a. Give examples of linear equations in one variable with one solution, infinitely many solutions, or no solutions. Show whichof these possibilities is the case by successively transforming thegiven equation into simpler forms, until an equivalent equationof the form $x = a$, $a = a$, or $a = b$ results (where a and b are different numbers).	1.1, 1.2, 1.3
	b. Solve linear equations with rational number coefficients,including equations whose solutions require expanding expressions using the distributive property and combining like terms.	1.1, 1.2, 1.3
	8.EE.C.8 Analyze and solve systems of two linear equations graphically.	
	a. Understand that solutions to a system of two linear equationsin two variables correspond to points of intersection of their graphs, because points of intersection satisfy both equations simultaneously.	4.9, 4.10
	b. Estimate solutions by graphing a system of two linear equations in two variables. Identify solutions by inspecting graphs.	4.9, 4.10

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	8.EE.C.9 By graphing on the coordinate plane or by analyzing a given graph, determine the solution set of a linear inequality in one or two variables.	1.5, 4.8
	Functions (F)	
A. Define, evaluate, andcompare functions.	**8.F.A.1** Understand that a function is a rule that assigns to eachinput exactly one output. The graph of a function is the set of ordered pairs consisting of an input and the correspondingoutput. (Function notation is not required in 8th grade.)	6.1, 6.2
	8.F.A.2 Compare properties of two functions each representedin a different way (algebraically, graphically, numerically in tables, or by verbal descriptions). *For example, given a linear function represented by a table of values and another linear function represented by an algebraic expression, determine which function has the greater rate of change.*	6.3
	8.F.A.3 Know and 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. *For example, the function $A = s^2$ giving the area of a square as a function of its side length is notlinear because its graph contains the points (1,1), (2,4) and (3,9),which are not on a straight line.*	6.3, 6.4
B. Use functions to model relationships between quantities.	**8.F.B.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 ofa linear function in terms of the situation it models and in termsof its graph or a table of values.	4.6, 4.7, 6.2, 6.3
	8.F.B.5 Describe qualitatively the functional relationship between two quantities by analyzing a graph (e.g., where the function is increasing or decreasing, linear or nonlinear). Sketcha graph that exhibits the qualitative features of a function that has been described verbally.	6.5
	Geometry (G)	
A. Understand and describethe effects	**8.G.A.1** Describe the effect of translations, rotations, reflections, and dilations on two-dimensional figures using coordinates.	2.1, 2.2, 2.3, 2.5

Standard		Tennessee Math Grade 8
oftransformations on two-dimensional figures and useinformal arguments to establish facts about angles.	a. Verify informally that lines are taken to lines, and determine when line segments are taken to line segments of the same length.	2.1, 2.2, 2.3, 2.4
	b. Verify informally that angles are taken to angles of the same measure.	2.1, 2.2, 2.3, 2.4
	c. Verify informally that parallel lines are taken to parallel lines.	2.1, 2.2, 2.3, 2.4
	d. Make connections between dilations and scale factors.	2.5, 2.7
	8.G.A.2 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.	2.6, 3.1, 3.2, 3.3, 3.4
B. Understand and applythe Pythagorean Theorem.	**8.G.B.3** Explain a model of the Pythagorean Theorem and its converse.	8.2, 8.6
	8.G.B.4 Know and apply the Pythagorean Theorem to determine unknown side lengths in right triangles in real-world and mathematical problems in two and three dimensions.	8.2
	8.G.B.5 Apply the Pythagorean Theorem to find the distance between two points in a coordinate system.	8.2
C. Solve real-world and mathematical problemsinvolving volume of cylinders, cones, and spheres.	**8.G.C.6** Apply the formulas for the volumes of cones, cylinders,and spheres to solve real-world and mathematical problems.	9.1, 9.2, 9.3, 9.4
	Statistics and Probability (SP)	
A. Investigate patterns of association in bivariatedata.	**8.SP.A.1** Construct and interpret scatter plots for bivariate measurement data to investigate patterns of associationbetween two quantities. Describe patterns such as clustering, outliers, positive or negative association, linear association, andnonlinear association.	5.3, 5.4, 5.5

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	8.SP.A.2 Know that straight lines are widely used to model linear 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 closenessof the data points to the line.	5.4
	8.SP.A.3 Use the equation of a linear model to solve problems in the context of bivariate measurement data, interpreting the slope and intercepts. *For example, in a linear model for a biologyexperiment, 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.*	5.4
B. Investigate chance processes and develop, use, and evaluate probability models	**8.SP.B.4** Find probabilities of and represent sample spaces for compound events using organized lists, tables, tree diagrams, and simulation.	
	a. Understand that, just as with simple events, the probability ofa compound event is the fraction of outcomes in the sample space for which the compound event occurs.	5.1, 5.2
	b. Represent sample spaces for compound events usingmethods such as organized lists, tables, and tree diagrams. For an event described in everyday language (*e.g., "rolling double sixes"*), identify the outcomes in the sample space which compose the event.	5.1

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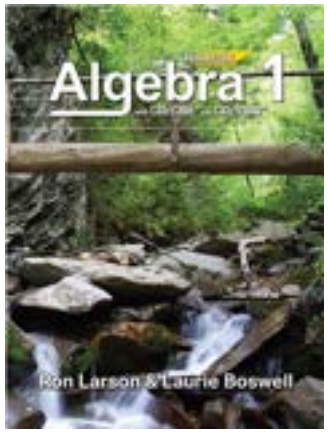
Correlated to the Tennessee Mathematics Standards for High School Algebra 1



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Standard		Tennessee Algebra 1 with CalcChat® and CalcView®
	Algebra I |A1	
	Number and Quantity	
	Quantities * (N.Q)	
A. Reason quantitatively and use units to understand problems.	**A1.N.Q.A.1** Use units as a way to understandreal-world problems.*	1.3
	a. Choose and interpret the scale and the originin graphs and data displays.*	10.4
	b. Use appropriate quantities in formulas,converting units as necessary.*	1.3
	c. Define and justify appropriate quantitieswithin a context for the purpose of modeling.*	1.3
	d. Choose an appropriate level of accuracywhen reporting quantities.*	1.4
	Algebra	
	Seeing Structure in Expressions * (A.SSE)	
A. Interpret the structure of expressions.	**A1.A.SSE.A.1** Interpret expressions thatrepresent a quantity in terms of its context.*	
	a. Interpret parts of an expression, such as terms,factors, and coefficients.*	2.1, 3.6, 7.1, 7.3
	b. Interpret complicated expressions by viewingone or more of their parts as a single entity.*	1.5, 4.7, 6.1, 6.3
	Creating Equations★ (A.CED)	
A. Create equations that describe numbers or relationships.	**A1.A.CED.A.1** Create equations and inequalities in one variable and use them to solve problems in a real-world context.*	1.1, 1.2, 1.5, 1.6, 2.1, 2.2, 2.3, 2.4, 2.5, 2.6, 9.3, 9.4
	A1.A.CED.A.2 Create equations in two variables to represent relationships between quantities and use them to solve problems in a real-world context. Graph equations with two variables on coordinate axes with labels and scales, and use the graphs to make predictions.*	3.4, 3.5, 3.6, 3.7, 3.8, 4.1, 4.2, 4.3, 4.7, 6.2, 6.3, 8.1, 8.2, 8.3, 8.4, 8.5

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	A1.A.CED.A.3 Create individual and systems of equations and/or inequalities to represent constraints in a contextual situation, and interpret solutions as viable or non-viable.*	5.1, 5.2, 5.3, 5.4, 5.5, 5.6, 5.7
	A1.A.CED.A.4 Rearrange formulas to isolate a quantity of interest using algebraic reasoning.*	1.7, 9.1, 9.3
	Arithmetic with Polynomials and Rational Expressions (A.APR)	
A. Perform arithmetic operations on polynomials.	**A1.A.APR.A.1** Add, subtract, and multiply polynomials. Use these operations to demonstrate that polynomials form a closed system that adhere to the same properties of operations as the integers.	7.1, 7.2, 7.3
	Reasoning with Equations and Inequalities (A.REI)	
A. Understand solving equations as aprocess of reasoning and explain the reasoning.	**A1.A.REI.A.1** Understand solving equations as a process of reasoning and explain the reasoning. Construct a viable argument to justify a solution method.	1.1, 1.2, 1.5, 1.6, 7.4
B. Solve equations andinequalities in one variable.	**A1.A.REI.B.2** Solve linear and absolute valueequations and inequalities in one variable.	1.1, 1.2, 1.5, 1.6, 2.2, 2.3, 2.4, 2.5, 2.6
	a. Solve linear equations and inequalities,including compound inequalities, in one variable. Represent solutions algebraically and graphically.	1.1, 1.2, 1.5, 2.2, 2.3, 2.4, 2.5
	b. Solve absolute value equations and inequalitiesin one variable. Represent solutions algebraically and graphically.	1.6, 2.6
	A1.A.REI.B.3 Solve quadratic equations andinequalities in one variable.	
	a. Solve quadratic equations by inspection (*e.g., for* $x^2 = 49$), taking square roots, knowing and applyingthe quadratic formula, and factoring, as appropriate to the initial form of the equation. Recognize when a quadratic equation has solutionsthat are not real numbers.	7.4, 7.5, 7.6, 7.7, 7.8, 9.1, 9.3, 9.4

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	b. Solve quadratic inequalities using the graph of the related quadratic equation.	9.5
C. Solve systemsof equations.	**A1.A.REI.C.4** Write and solve a system oflinear equations in real-world context.*	5.1, 5.2, 5.3, 5.4
D. Represent and solve equations and inequalities graphically.	**A1.A.REI.D.5** Understand that the graph of anequation in two variables is the set of all its solutions plotted in the coordinate plane, often forming a curve (which could be a line).	3.3
	A1.A.REI.D.6 Explain why the *x*-coordinates of thepoints 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 approximate solutions by graphing the functions or making a table of values,using technology when appropriate.*	5.5
	A1.A.REI.D.7 Graph the solution set to a system of linear inequalities in two variables as the intersection of the corresponding half-planes.	5.7
	Functions	
	Interpreting Functions (F.IF)	
A. Understandthe concept of function anduse function notation.	**A1.F.IF.A.1** Understand that a function from one set (called the domain) to another set (called therange) assigns to each element of the domain exactly one element of the range. If f is a functionand x is an element of its domain, then $f(x)$ denotes the output of f corresponding to the input x. The graph of f is the graph of the equation$y = f(x)$.	3.1, 3.4
	A1.F.IF.A.2 Use function notation.*	
	a. Use function notation to evaluate functions forinputs in their domains, including functions of two variables.	3.4
	b. Interpret statements that use function notation in terms of a context.	3.4
	A1.F.IF.A.3 Understand geometric formulas asfunctions.*	3.1

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B. Interpret functions that arise in applications in terms of the context.	**A1.F.IF.B.4** For a function that models a relationship between two quantities, interpret keyfeatures of graphs and tables in terms of the quantities, and sketch graphs showing keyfeatures given a verbal description of therelationship.*	3.2, 3.6, 8.1, 8.3, 8.4, 9.2
	A1.F.IF.B.5 Relate the domain of a function to its graph and, where applicable, to the context of thefunction it models. *	3.3, 3.8, 4.7
	A1.F.IF.B.6 Calculate and interpret the average rateof change of a function (presented symbolically or as a table) over a specified interval. Estimate and interpret the rate of change from a graph.*	8.6
C. Analyze functions using different representations.	**A1.F.IF.C.7** Graph functions expressedalgebraically and show key features of the graph by hand and using technology.*	3.4, 3.5, 3.6, 3.7, 3.8, 4.7, 6.2, 6.3, 8.1, 8.2, 8.3, 8.4, 8.5, 9.2
	A1.F.IF.C.8 Write a function defined by an expression in different but equivalent forms to reveal and explain different properties of the function. *	
	a. Rewrite quadratic functions to show zeros, extreme values, and symmetry of the graph, and interpret these in terms of a real-world context.	8.5
	A1.F.IF.C.9 Compare properties of functions represented algebraically, graphically, numericallyin tables, or by verbal descriptions.*	
	a. Compare properties of two different functions.Functions may be of different types and/or represented in different ways.	3.2, 3.4, 8.3, 8.6
	b. Compare properties of the same function on two different intervals or represented in two different ways.	3.2, 8.3, 8.6
	Building Functions (F.BF)	
A. Build afunction thatmodels a relationship between two quantities.	**A1.F.BF.A.1** Build a function that describes arelationship between two quantities.*	
	a. Determine steps for calculation, a recursiveprocess, or an explicit expression from a context.	4.1, 4.2, 4.6, 6.2, 6.3, 6.4, 6.5, 8.4, 8.5, 8.6

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B. Build new functions from existing functions.	**A1.F.BF.B.2** Identify the effect on the graph of replacing $f(x)$ by $f(x) + k$, $k\,f(x)$, $f(kx)$, and $f(x + k)$ forspecific values of k (both positive and negative); find the value of k given graphs.	3.7, 3.8, 8.1, 8.2, 8.4
	Linear, Quadratic, and Exponential Models * (F.LE)	
A. Constructand comparelinear, quadratic, and exponential models andsolve problems.	**A1.F.LE.A.1** Distinguish between situations that can be modeled with linear functions and with exponential functions.*	
	a. Know that linear functions grow by equal differences over equal intervals and that exponential functions grow by equal factors over equal intervals.	3.6, 6.2
	b. Recognize situations in which one quantitychanges at a constant rate per unit interval relative to another.	3.3, 4.1, 4.2
	c. Recognize situations in which a quantity growsor decays by a constant factor per unit interval relative to another.	6.3
	A1.F.LE.A.2 Construct linear and exponential functions, including arithmetic and geometric sequences, given a graph, a table, a description of a relationship, or input-output pairs.*	4.1, 4.2, 4.3, 4.6, 6.2, 6.3, 6.4, 6.5
B. Interpret expressions for functions in terms of the situation they model.	**A1.F.LE.B.3** Interpret the parameters in alinear or exponential function in terms of a context.*	3.6, 4.4, 4.5
	Statistics and Probability	
	Interpreting Categorical and Quantitative Data * (S.ID)	
A. Summarize, represent, and interpret data on a single count or	**A1.S.ID.A.1** Use measures of center to solve real-world and mathematical problems.*	10.1
	A1.S.ID.A.2 Use statistics appropriate to the shapeof the data distribution to compare center (mean, median, and/or mode) and spread (range, interquartile range) of two or more different data sets.*	10.3

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measurement variable.	**A1.S.ID.A.3** Interpret differences in shape, center,and spread in the context of the data sets, accounting for possible effects of extreme data points.*	10.1, 10.2, 10.3
B. Summarize, represent, and interpret data on two categorical and quantitative variables.	**A1.S.ID.B.4** Represent data from twoquantitative variables on a scatter plot, and describe how the variables are related. Fit a function to the data; use functions fitted to datato solve problems in the context of the data.*	4.4, 4.5, 6.2, 9.2
C. Interpret linear models.	**A1.S.ID.C.5** Interpret the rate of change and the constant term of a linear model in the context of data.*	4.4, 4.5
	A1.S.ID.C.6 Use technology to compute the correlation coefficient of a linear model; interpret the correlation coefficient in the context of the data.*	4.5
	A1.S.ID.C.7 Explain the differences betweencorrelation and causation. Recognize situations where an additional factor may be affecting correlated data.*	4.5

Tennessee Geometry with CalcChat® and CalcView®

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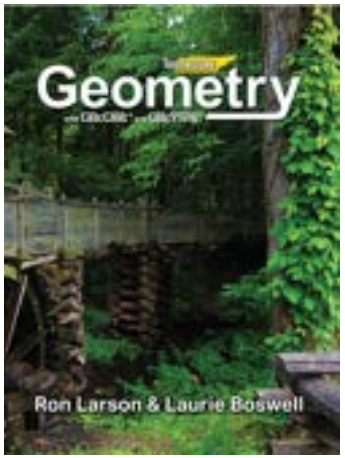
Correlated to the Tennessee Mathematics Standards for High School Geometry



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Standard		Tennessee Geometry with CalcChat® and CalcView®
	Geometry | G	
	Number and Quantity	
	Quantities * (N.Q)	
A. Reason quantitatively and use units tosolve problems.	**G.N.Q.A.1** Use units as a way to understand real-world problems.*	10.3, 10.4, 10.5, 11.2, 11.3, 11.7
	a. Use appropriate quantities in formulas,converting units as necessary.	10.4
	b. Define and justify appropriate quantities withina context for the purpose of modeling.	10.5, 11.2, 11.3, 11.7
	c. Choose an appropriate level of accuracy whenreporting quantities.	10.3, 10.5, 11.2, 11.3, 11.7
	Geometry	
	Congruence (G.CO)	
A. Experimentwith transformations in the plane.	**G.CO.A.1** Describe transformations as functions that take points in the plane (pre-image) as inputs and give other points (image) as outputs. Comparetransformations that preserve distance and angle measure to those that do not, by hand for basic transformations and using technology for more complex cases.	4.1, 4.2, 4.3, 4.5
	G.CO.A.2 Given a rectangle, parallelogram, trapezoid, or regular polygon, determine thetransformations that carry the shape onto itself and describe them in terms of the symmetry of thefigure.	4.2, 4.3
	G.CO.A.3 Develop definitions of rotations, reflections, and translations in terms of angles, circles, perpendicular lines, parallel lines, and line segments.	1.1, 1.6, 3.1, 4.1, 4.2, 4.3
	G.CO.A.4 Given a geometric figure, draw the image of the figure after a sequence of one or more rigid motions, by hand and using technology. Identify a sequence of rigid motions that will carry a given figure onto another.	4.1, 4.2, 4.3, 4.4, 4.6

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B. Understand congruence in terms of rigid motions.	**G.CO.B.5** Given two figures, use the definition of congruence in terms of rigid motions to determineinformally if they are congruent.	4.1, 4.2, 4.3, 4.4
	G.CO.B.6 Use the definition of congruence in terms of rigid motions to show that two trianglesare congruent if and only if corresponding pairs ofsides and corresponding pairs of angles are congruent.	5.2
	G.CO.B.7 Explain how the criteria for trianglecongruence (ASA, SAS, AAS, SSS, and HL) follow from the definition of congruence in terms of rigid motions.	5.3, 5.5, 5.6
C. Use geometric theorems tojustify relationships.	**G.CO.C.8** Use definitions and theorems about lines and angles to solve problems and to justify relationships in geometric figures.	2.1, 2.2, 2.3, 2.4, 2.5, 2.6, 3.2, 3.3, 3.4, 6.1
	G.CO.C.9 Use definitions and theorems about triangles to solve problems and to justify relationships in geometric figures.	2.1, 2.2, 2.3, 2.4, 5.1, 5.4, 6.2, 6.3, 6.4, 6.5, 6.6
	G.CO.C.10 Use definitions and theorems about parallelograms to solve problems and to justify relationships in geometric figures.	2.1, 2.2, 2.3, 2.4, 7.2, 7.3, 7.4
D. Perform geometric constructions.	**G.CO.D.11** Perform formal geometric constructions with a variety of tools and methods (compass and straightedge, string, reflective devices, paper folding, dynamic geometric software, etc.).	1.2, 1.3, 1.5, 3.3, 3.4
	G.CO.D.12 Use geometric constructions to solve geometric problems in context, by hand and usingtechnology.*	6.1, 6.2
	Similarity, Right Triangles, and Trigonometry (G.SRT)	
A. Understand similarity in terms of similarity transformations.	**G.SRT.A.1** Use properties of dilations given by a center and a scale factor to solve problems and tojustify relationships in geometric figures.	4.5
	G.SRT.A.2 Define similarity in terms of transformations. Use transformations to determine whether two figures are similar.	4.6, 7.1, 8.1
B. Use similarity to solve problemsand justify relationships.	**G.SRT.B.3** Use congruence and similarity criteria for triangles to solve problems and to justify relationships in geometric figures.	2.1, 2.2, 2.3, 2.4, 5.7, 8.1, 8.2, 8.3, 8.4, 9.1, 9.2, 9.3, 10.4
C. Define trigonometric ratios	**G.SRT.C.4** Use side ratios in right triangles todefine trigonometric ratios.	9.4, 9.5

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and solveproblems involving triangles.	**a.** Understand that by similarity, side ratios in righttriangles are properties of the angles in the triangle, leading to definitions of trigonometric ratios for acute angles.	9.4, 9.5
	b. Explain and use the relationship between thesine and cosine of complementary angles.	9.5
	G.SRT.C.5 Solve triangles.*	9.1, 9.4, 9.5, 9.6
	a. Know and use the Pythagorean Theorem and trigonometric ratios (sine, cosine, tangent, and their inverses) to solve right triangles in a real- world context.	9.1, 9.4, 9.5, 9.6
	b. Know and use relationships within special right triangles to solve problems in a real-world context.	9.2
	c. Use the Law of Sines and Law of Cosines to solvenon-right triangles in a real-world context.	9.7
	Circles * (G.C)	
A. Find areas of sectors ofcircles.	**G.C.A.1** Use proportional relationships between the area of a circle and the area of a sector within the circle to solve problems in a real-world context.*	10.2, 10.3
	Expressing Geometric Properties with Equations (G.GPE)	
A. Use coordinates to solve problems and justify simple geometric theorems algebraically.	**G.GPE.A.1** Use coordinates to justify geometric relationships algebraically and to solve problems.	3.5, 5.1, 5.8, 6.3, 7.3, 7.4, 7.5, 10.1, 10.3
	G.GPE.A.2 Use the slope criteria for parallel and perpendicular lines to solve problems and to justify relationships in geometric figures.	3.5, 8.3
	G.GPE.A.3 Understand the relationship betweenthe Pythagorean Theorem and the distance formula and use an efficient method to solve problems on the coordinate plane.	1.3, 1.4, 10.1, 10.3
	Geometric Measurement and Dimension (G.GMD)	
A. Explainvolume and surface area	**G.GMD.A.1** Understand and explain the formulas for the volume and surface area of a cylinder, cone,prism, and pyramid.	11.1, 11.2, 11.3, 11.4, 11.5

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formulas and use them to solve problems.	**G.GMD.A.2** Use volume and surface areaformulas for cylinders, cones, prisms, pyramids, and spheres to solve problems in a real-world context.*	11.2, 11.3, 11.4, 11.5, 11.6, 11.8
	Modeling with Geometry * (G.MG)	
A. Apply geometric concepts in modeling situations.	**G.MG.A.1** Use geometric shapes, their measures, and their properties to model objects found in a real-world context for the purpose of approximating solutions to problems.*	1.4, 10.5, 11.7
	Statistics and Probability	
	Conditional Probability and the Rules of Probability* (S.CP)	
A. Understand independence and conditional probability anduse them tocreate visual representations of data.	**G.S.CP.A.1** Use set notation to representcontextual situations.*	12.1, 12.3
	a. 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").	12.1, 12.3
	b. Flexibly move between visual models (Venn diagrams, frequency tables, etc.) and setnotation.	12.1, 12.3
B. Use the rules of probability to compute probabilities of compound events in a uniform probability model.	**G.S.CP.B.2** 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 given context.*	12.2
	G.S.CP.B.3 Understand and apply the AdditionRule.*	12.3
	a. Explain the Addition Rule, $P(A \text{ or } B) = P(A) + P(B) - P(A \text{ and } B)$ in terms of visual models (Venndiagrams, frequency tables, etc.).	12.3
	b. Apply the Addition Rule to solve problems and interpret the answer in terms of the givencontext.	12.3
C. Apply geometric concepts to situations involving probability.	**G.S.CP.C.4** Calculate probabilities usinggeometric figures.*	12.1

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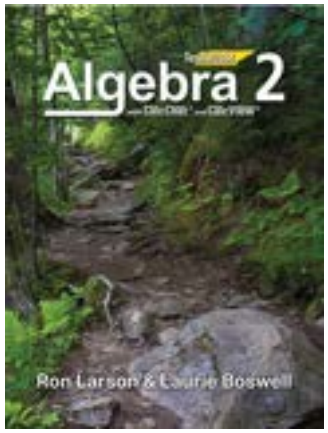

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Standard		Tennessee Algebra 2 with CalcChat® and CalcView®
	Algebra II |A2	
	Number and Quantity	
	The Real Number System (N.RN)	
A. Extend the properties of exponents to rational exponents.	**A2.N.RN.A.1** Extend the properties of integerexponents to rational exponents.	4.1, 4.2
	a. Develop the meaning of rational exponents byapplying the properties of integer exponents.	4.1
	b. Explain why $x^{1/n}$ can be written as the n^{th} root of x.	4.1
	c. Rewrite expressions involving radicals and rational exponents using the properties of exponents.	4.1, 4.2
	Quantities ★ (N.Q)	
A. Reason quantitativelyand use units to understand problems.	**A2.N.Q.A.1** Use units as a way to understand real-world problems.*	1.1, 1.5, 2.3, 3.8, 5.1, 5.7, 7.2, 7.3
	a. Choose and interpret the scale and the origin ingraphs and data displays.	1.5, 2.3, 3.8, 5.1, 5.7, 7.2, 7.3
	b. Use appropriate quantities in formulas,converting units as necessary.	1.1, 5.1, 5.7
	c. Define and justify appropriate quantities withina context for the purpose of modeling.	1.1, 1.5, 2.3, 3.4, 3.8, 5.7
	d. Choose an appropriate level of accuracy whenreporting quantities.	1.2, 3.8, 5.7
	Matrices ★ (N.M)	
A. Perform operations on matrices anduse matrices in applications.	**A2.N.M.A.1** Use matrices to represent data in a real-world context. Interpret rows, columns, and dimensions of matrices in terms of the context.*	10.1, 10.2
	A2.N.M.A.2 Perform operations on matrices in areal-world context.*	10.1, 10.2
	a. Multiply a matrix by a scalar to produce a new matrix.	10.1, 10.2
	b. Add and/or subtract matrices by hand andusing technology.	10.1, 10.2

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	c. Multiply matrices of appropriate dimensions, by hand in simple cases and using technology for more complicated cases.	10.2
	d. Describe the roles that zero matrices and identity matrices play in matrix addition and multiplication, recognizing that they are similar to the roles of 0 and 1 in the real number system.	10.1, 10.2
	A2.N.M.A.3 Create and use augmented matrices to solve systems of linear equations in real-worldcontexts, by hand and using technology.*	10.3
	Algebra	
	Seeing Structure in Expressions ★ (A.SSE)	
A. Interpret the structure of expressions.	**A2.A.SSE.A.1** Interpret expressions thatrepresent a quantity in terms of its context.*	2.2, 2.3, 3.8, 5.7
	a. Interpret parts of an expression, such as terms, factors, and coefficients.	1.5, 2.2, 2.3, 2.4, 3.2, 3.4, 3.8, 4.6, 5.1, 5.2, 5.7
	b. Interpret complicated expressions by viewing one or more of their parts as a singleentity.	2.2, 2.3, 2.4, 3.5, 3.8, 5.1, 5.2, 5.7
	Arithmetic with Polynomials and Rational Expressions (A.APR)	
A. Understandthe relationship between zeros and factors of polynomials.	**A2.A.APR.A.1** Know and apply the Factor Theorem: For a polynomial $p(x)$ and a number a, $p(a) = 0$ if and only if $(x - a)$ is a factor of $p(x)$.	3.2, 3.3, 3.4, 3.5, 3.7
	A2.A.APR.A.2 Identify zeros of polynomials when suitable factorizations are available, and use thezeros to construct a rough graph of the function defined by the polynomial.	2.2, 2.4, 3.1, 3.4, 3.5, 3.7
	Creating Equations ★ (A.CED)	
A. Create equations thatdescribe numbers or relationships.	**A2.A.CED.A.1** Create equations and inequalities in one variable and use them to solve problems ina real-world context.*	2.4, 3.5, 4.1, 4.4, 5.6
	A2.A.CED.A.2 Create equations in two variables to represent relationships between quantities and use them to solve problems in a real-world context. Graph equations with two variables on coordinate axes with labels and scales, and use the graphs to make predictions.*	1.3, 1.4, 1.5, 1.6, 2.3, 2.4, 3.5, 3.6, 3.8, 4.3, 4.5, 4.6, 4.7, 5.1, 5.2, 5.3, 5.4, 5.7, 9.2, 9.3, 10.3

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	A2.A.CED.A.3 Rearrange formulas to isolate a quantity of interest using algebraic reasoning.*	1.5, 3.7, 4.2, 4.3, 4.4, 4.7
	Reasoning with Equations and Inequalities (A.REI)	
A. Understand solving equations as aprocess of reasoning and explain the reasoning.	**A2.A.REI.A.1** Understand solving equations as a process of reasoning and explain the reasoning. Construct a viable argument to justify a solution method.	2.4, 3.5, 4.1, 4.4, 5.6, 9.2, 9.3
	A2.A.REI.A.2 Solve radical equations in onevariable, and identify extraneous solutions when they exist.	4.4
B. Solve systems of equations.	**A2.A.REI.B.3** Write and solve a system of linearequations in a real-world context. *	2.5, 10.3
	A2.A.REI.B.4 Solve a system consisting of a linear equation and a quadratic equation in two variables algebraically, graphically, and using technology.	2.5
	Functions	
	Interpreting Functions ★ (F.IF)	
A. Interpret functions that arise in applications in terms of the context.	**A2.F.IF.A.1** 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. ★	1.5, 1.6, 1.7, 2.2, 2.3, 2.4, 3.1, 3.5, 3.7, 3.8, 4.3, 4.5, 5.1, 5.2, 5.3, 9.4
	A2.F.IF.A.2 Calculate and interpret the averagerate of change of a function (presented algebraically or as a table) over a specified interval. Estimate and interpret the rate of change from a graph. *	1.5, 2.3, 3.1, 5.1, 5.2, 5.3
	A2.F.IF.A.3 Understand geometric formulas asfunctions.*	2.1, 3.6
B. Analyzefunctions usingdifferent representations.	**A2.F.IF.B.4** Graph functions expressedalgebraically and show key features of the graphby hand and using technology.*	1.3, 1.4, 1.6, 2.1, 2.2, 2.4, 2.5, 3.1, 3.5, 3.6, 3.7, 3.8, 4.3, 4.4, 4.5, 4.7, 5.1, 5.2, 5.3, 5.4, 5.6, 5.7, 9.2, 9.3
	A2.F.IF.B.5 Write a function defined by an expression in different but equivalent forms to reveal and explain different properties of the function.*	1.5, 2.4, 3.4, 3.5, 4.3, 5.1, 5.2

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	a. Rewrite quadratic functions to show zeros, extreme values, and symmetry of the graph, and interpret these in terms of a real-world context.	2.2, 2.4
	b. Know and use the properties of exponents to interpret expressions for exponential functions in terms of a real-world context.	5.1, 5.7
	A2.F.IF.B.6 Compare properties of functions represented algebraically, graphically,numerically in tables, or by verbal descriptions.*	1.5, 1.6, 1.7, 2.2, 4.3, 5.1, 5.2, 5.3
	a. Compare properties of two different functions.Functions may be of different types and/or represented in different ways.	1.5, 1.6, 2.2, 4.3, 5.1, 5.2, 5.3
	b. Compare properties of the same function on two different intervals or represented in two different ways.	1.6, 1.7, 2.3, 3.1
	Building Functions (F.BF)	
A. Build afunction thatmodels a relationship between two quantities.	**A2.F.BF.A.1** Build a function that describes arelationship between two quantities.*	4.5, 4.6, 5.6
	a. Combine standard function types usingarithmetic operations.	4.5, 5.6
	b. Combine standard function types usingcomposition.	4.6
	A2.F.BF.A.2 Define sequences as functions, including recursive definitions, whose domain is asubset of the integers. Write explicit and recursive formulas for arithmetic and geometric sequences in context and connect them to linear and exponential functions.*	9.1, 9.2, 9.3, 9.4
B. Build new functions from existing functions.	**A2.F.BF.B.3** Identify the effect on the graph of replacing $f(x)$ by $f(x) + k$, $k\,f(x)$, $f(kx)$, and $f(x + k)$ for specific values of k (both positive and negative); find the value of k given the graphs.	1.3, 1.4, 2.1, 3.6, 4.3, 5.4
	A2.F.BF.B.4 Find the inverse of a function.	4.7, 5.4
	a. Determine whether a function is one-to-one.	4.7
	b. Find the inverse of a function on an appropriatedomain.	4.7
	c. Given an invertible function on an appropriatedomain, identify the domain of the inverse function.	4.7

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	Linear, Quadratic, and Exponential Models ★ (F.LE)	
A. Constructand comparelinear, quadratic, and exponential models and solve problems.	**A2.F.LE.A.1** Know the relationship betweenexponential functions and logarithmic functions. *	5.3, 5.5
	a. Solve exponential equations using a variety ofstrategies, including logarithms.	5.6
	b. Understand that a logarithm is the solution to $ab^{ct} = d$, where a, b, c, and d are numbers.	5.5, 5.6
	c. Evaluate logarithms using technology.	5.3, 5.5, 5.6
	A2.F.LE.A.2 Know that a quantity increasing exponentially eventually exceeds a quantityincreasing linearly, quadratically, or cubically.*	5.1
	Statistics and Probability	
	Interpreting Categorical and Quantitative Data * (S.ID)	
A. Summarize, represent, and interpret dataon a singlecount or measurement variable.	**A2.S.ID.A.1** Use statistics appropriate to the shapeof the data distribution to compare center (mean,median, and/or mode) and spread (range, standard deviation) of two or more different data sets.*	7.1, 7.2, 7.3
	A2.S.ID.A.2 Use the mean and standard deviation of a data set to fit it to a normal distribution and toestimate population percentages using the Empirical Rule.*	6.5, 8.1
	A2.S.ID.A.3 Compute, interpret, and compare z- scores for normally distributed data in a real-worldcontext.*	8.1
B. Summarize, represent, and interpret data on two categorical and quantitative variables.	**A2.S.ID.B.4** Represent data from two quantitativevariables on a scatter plot, and describe how the variables are related. Fit a function to the data; usefunctions fitted to data to solve problems in the context of the data.*	1.5, 2.3, 3.8, 5.7
	Making Inferences and Justifying Conclusions *(S.IC)	
A. Make inferences andjustify	**A2.S.IC.A.1** Recognize the purposes of and differences among sample surveys, experiments,and observational studies.*	8.3, 8.4

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conclusions from samplesurveys, experiments, and observational studies.	**A2.S.IC.A.2** Identify potential sources of bias instatistical studies.*	8.3
	A2.S.IC.A.3 Distinguish between a statistic and a parameter; Evaluate reports based on data and recognize when poor conclusions are drawn from well-collected data.*	8.2, 8.4
	Conditional Probability and the Rules of Probability *(S.CP)	
A. Understand independence and conditional probability anduse them to create visual representations of data.	**A2.S.CP.A.1** Recognize and explain the concepts of conditional probability and independence in everyday language and everyday situations. Categorize events as independent or dependent.*	6.4
B. Understandand apply basic concepts of probability.	**A2.S.CP.B.2** Apply statistical countingtechniques.*	6.6
	a. Use the Fundamental Counting Principle tocompute probabilities of compound events and solve problems.	6.6
	b. Use permutations and combinations to compute probabilities of compound events and solve problems.	6.6, 6.7
	A2.S.CP.B.3 Use the Law of Large Numbers toassess the validity of a statistical claim. *	6.1
C. Use the rulesof probability to compute probabilities of compound events in auniform probability model.	**A2.S.CP.C.4** 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 given context.*	6.1, 6.2, 6.3, 6.4