Mathematics Calculator Guidance
Grade 7

TN Standard	Calculator Tested Subpart	Non-Calculator Tested Subpart	Lesson(s) i-Ready	Notes
Link to Calculator Step Guide				
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 the complex fraction (1/2) **/** (1/4) miles per hour, equivalently 2 miles per hour.*	✓	✓	Unit 1, Lesson 2	Historically, this standard appeared on the calculator and non-calculator subpart of the TCAP practice assessment. Instruction should prepare students to demonstrate mastery with and without the aid of the calculator.
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	✓	✓	Unit 1, Lessons 3, 4, and 5	Historically, this standard appeared on the calculator and non-calculator subpart of the TCAP practice assessment. Instruction should prepare students to demonstrate mastery with and without the aid of the calculator. The calculator can be used to convert fractions to decimals to

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straight line through the origin). **b.** Identify the constant of proportionality (unit rate) in tables, graphs, equations, diagrams, and verbal descriptions of proportional relationships. **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 constant price p, the relationship between the total cost and the number of items can be expressed as: $t=pn$. **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.				compare proportions for equivalence. The calculator can be used to calculate the constant of proportionality. The calculator can be used to calculate proportional relationships between values. The calculator can be used to calculate proportional relationships between values or a set of values when given a graph.
7.RP.A.3 Use proportional relationships to solve multi-	✓		Unit 1, Lesson 5 Unit 5, Lessons 20 and 21	Historically, this standard appeared on the calculator

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step ratio and percent problems. *Examples: batting averages, recipes, simple interest, tax, markups and markdowns, gratuities and commissions, fees, percent increase and decrease, percent error, etc.*				subpart of the TCAP practice assessment. Instruction should prepare students to demonstrate mastery with and without the aid of the calculator. The calculators can be used to convert percentages to decimals. The calculator can be used to calculate and solve multi-step ratio equations using the appropriate operations and proportional relationships.
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. 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	✓	✓	Unit 2, Lessons 7, 8, 9, and 10	Historically, this standard appeared on the calculator and non-calculator subpart of the TCAP practice assessment. Instruction should prepare students to demonstrate mastery with and without the aid of the calculator. The calculator can be used to find the sum or difference opposite integers. The calculator can be used to calculate the sum or difference of integers.

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number and its opposite have a sum of 0 (are additive inverses). Interpret sums of rational numbers by describing real-world contexts. **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. **c.** Apply properties of operations as strategies to add and subtract rational numbers.				The calculator can be used to calculate the difference or sum of rational numbers to verify the distance between two given values.
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	✓	✓	Unit 3, Lessons 11, 12, and 13	Historically, this standard appeared on the calculator and non-calculator subpart of the TCAP practice assessment. Instruction should prepare students to demonstrate mastery with and without the aid of the calculator.

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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. **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. **c.** Apply properties of operations as strategies to multiply and divide rational numbers. **d.** Convert a rational number to a decimal using long division; know that the			The calculator can be used to calculate and/or check operations of rational numbers. The calculator can be used to solve for products and quotients when multiplying or dividing rational numbers. The calculator can be used to divide ratios to convert them into decimals. The calculator can be used to apply properties of operations to calculate rational numbers. If the calculator is permitted, the calculators can be used to divide ratios to convert them into decimals.

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decimal form of a rational number terminates or eventually repeats.				
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.)	✓		Unit 3, Lesson 14 and One-Day Activity: Solve Problems with Complex Fractions	Historically, this standard appeared on the calculator subpart of the TCAP practice assessment. Instruction should prepare students to demonstrate mastery with and without the aid of the calculator The calculator can be used to convert ratios to decimals. The calculator can be used when applying the four mathematical operations to expressions involving rational numbers.
7.EE.A.1 Apply properties of operations as strategies to add, subtract, factor, and expand linear expressions with rational coefficients.	✓		Unit 4, Lesson 15	Historically, this standard appeared on the calculator subpart of the TCAP practice assessment. Instruction should prepare students to demonstrate mastery with and without the aid of the calculator.

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				The calculator can be used to apply mathematical operations to coefficients when simplifying or expanding linear expressions.
7.EE.A.2 Rewrite and connect equivalent expressions in different 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 a 25% discount. How is the discounted price P related to the original cost C of the shoes? C - .25C = P. In other words, P is 75% of the original cost for C - .25C can be written as .75C.*	✓	✓	Unit 4, Lesson 16	Historically, this standard has appeared on **both** the **calculator and non-calculator** subparts of the TCAP assessment.\n\nIf the calculator is permitted, the calculator can be used to apply mathematical operations to coefficients when simplifying or expanding linear expressions. The calculator can also be leveraged to calculate conversions and differences in quantities.
7.EE.B.3 Solve multi-step real-world and mathematical problems posed with positive and negative rational numbers presented in any form (whole numbers, fractions, and decimals).	✓	✓	Unit 3, Lessons 13 and 14	Historically, this standard appeared on the calculator and non-calculator subpart of the TCAP practice assessment.\n\nInstruction should prepare students to demonstrate

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a. Apply properties of operations to calculate with numbers in any form; convert between forms as appropriate. b. Assess the reasonableness of answers using mental computation and estimation strategies.				mastery with and without the aid of the calculator. The calculator can be used to find solutions when applying mathematical operations to expressions involving rational numbers. The calculator can also be leveraged to calculate conversions.
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 forms fluently. Compare an algebraic solution to an	✓	✓	Unit 4, Lessons 17, 18, and 19	Historically, this standard has appeared on **both** the **calculator and non-calculator** subparts of the TCAP assessment. Instruction should prepare students to demonstrate mastery with and without the aid of the calculator. The calculator can be used to find solutions to expressions when applying mathematical operations involving rational numbers. The calculator can be used to find solutions to inequalities when applying mathematical operations involving rational numbers.

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arithmetic solution, identifying the sequence of the operations used in each approach. *For example, the perimeter of a rectangle is 54 cm. Its length is 6 cm. What is its width?* **b.** Solve real-world and mathematical problems leading to inequalities of the form *px + q > r, px + q < r, px + q ≥ r* or *px + q ≤ r* where *p, q*, and *r* are specific rational numbers. Graph the solution set of the inequality on a number line and interpret it in the context of the problem. *(Note that inequalities using >, <, >, and < are included in this standard.) For example: As a salesperson, you are paid $50 per week plus $3 per sale. This week you want your pay to be at least $100. Write an*			If the calculators are permitted, the calculators can be used to find solutions to inequalities when applying mathematical operations involving rational numbers.

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inequality for the number of sales you need to make and describe the solutions.			
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 scale drawing at a different scale.	✓		Unit 1, Lesson 1	Historically, this standard appeared on the calculator subpart of the TCAP practice assessment. Instruction should prepare students to demonstrate mastery with and without the aid of the calculator. The calculator can be used to apply mathematical operations to a given scale drawing. The calculator can be used to calculate or create new lengths or scale drawings when given a scale factor. The calculator can be used to calculate conversions.
7.G.A.2 Draw triangles with given conditions: three angle measures or three side measures. Notice when the conditions determine a	✓		Unit 6, Lesson 29	Historically, this standard appeared on the calculator subpart of the TCAP practice assessment.

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unique triangle, more than one triangle, or no triangle.				Instruction should prepare students to demonstrate mastery with and without the aid of the calculator.
7.G.B.3 Know the formulas for the area and circumference of a circle and use them to solve problems. Explore the relationship between the radius, the circumference, the area of a circle, and the number π.			Unit 1, Lesson 6	Historically, this standard has not been assessed on previous TCAP practice assessments. Instruction should prepare students to demonstrate mastery with and without the aid of the calculator. The calculator can be used to find area and/or circumference.
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.			Unit 6, Lesson 28	Historically, this standard has not been assessed on previous TCAP practice assessments. Instruction should prepare students to demonstrate mastery with and without the aid of the calculator. The calculator can be used to solve equations using math operations and angle relationships.

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Standard				
7.G.B.5 Solve real-world and mathematical problems involving 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.	✓		Unit 6, Lessons 25 and 26	Historically, this standard appeared on the calculator subpart of the TCAP practice assessment. Instruction should prepare students to demonstrate mastery with and without the aid of the calculator. The calculator can be used to find solutions for area and/or circumference. The calculator can be used to find solve equations involving math operations and angle relationships.
7.SP.A.1 Explore how statistics can be used to gain information about a population by examining a sample of the population; generalizations about a population from a sample are valid only if the sample is representative of that population. Understand that random sampling tends to produce representative samples and support valid inferences.			Unit 5, Lesson 22	Historically, this standard has not been assessed on previous TCAP practice assessments. Instruction should prepare students to demonstrate mastery with and without the aid of the calculator.

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Standard				
7.SP.A.2 Collect and use data from a random sample to draw inferences about a population with an unknown characteristic of 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*.	✓		Unit 5, Lesson 23	Historically, this standard appeared on the calculator subpart of the TCAP practice assessment. Instruction should prepare students to demonstrate mastery with and without the aid of the calculator. The calculator can be used to calculate estimations.
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*		✓	Unit 5, Lesson 24	Historically, this standard has appeared on the non-calculator subpart of the TCAP assessment. Instruction should prepare students to demonstrate mastery with and without the aid of the calculator.

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between the two distributions of heights is noticeable.				The calculator can be used to solve problems using mathematical operations. The calculator can be used to calculate estimations.
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.*	✓		Unit 5, lesson 24	Historically, this standard has appeared on the calculator subpart of the TCAP assessment. Instruction should prepare students to demonstrate mastery with and without the aid of the calculator. The calculator can be used to solve problems using mathematical operations. The calculator can be used to calculate estimations.
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.	✓		Unit 7, Lesson 30	Historically, this standard has appeared on the calculator subpart of the TCAP assessment. Instruction should prepare students to demonstrate mastery with and without the aid of the calculator.

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				The calculator can be used to calculate the value or simplify ratios.

The calculator can be used to calculate estimations. |
| **7.SP.C.6** Calculate theoretical and experimental probability of simple events.
a. Approximate the probability of a chance event by collecting data on the chance process that produces it and observing its long-run relative frequency, and predict the approximate relative frequency given the probability.
b. Calculate the theoretical probability of a simple event.
c. Compare theoretical probabilities to experimental probabilities; explain any possible sources of discrepancy. *For example, when rolling a number cube 600 times, predict that a 3 or 6 would be rolled roughly 200 times, but probably not exactly 200 times.* | ✓ | | Unit 7, Lessons 31, 32, and 33 | Historically, this standard has appeared on the calculator subpart of the TCAP assessment.

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The calculator can be used to calculate the value or simplify ratios.

The calculator can be used to calculate estimations. |
| **7.SP.C.7** Develop a probability model and use it to find | ✓ | | Unit 7, Lesson 32 | Historically, this standard has appeared on the calculator |

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				subpart of the TCAP assessment.
experimental or theoretical probabilities of events.				
a. Use a uniform probability model by assigning equal probability to all outcomes, and use the model 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.*				Instruction should prepare students to demonstrate mastery with and without the aid of the calculator. The calculator can be used to calculate the value or simplify ratios. The calculator can be used to calculate estimations.
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?*				

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7.SP.D.8 Summarize a numerical data set in relation to its context. **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. **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.	✓		One-Day Activity: Work with Interquartile Range	Historically, this standard has appeared on the calculator subpart of the TCAP assessment. Instruction should prepare students to demonstrate mastery with and without the aid of the calculator. The calculator can be used to calculate estimations involving data sets.

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