Texas Tutorials are designed specifically for the Texas Essential Knowledge and Skills (TEKS) to prepare students for the State of Texas Assessment of Academic Readiness (STAAR)® end-of-course assessments.

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Math Tutorials offer targeted instruction, practice and review designed to develop computational fluency, deepen conceptual understanding, and apply mathematical practices. They automatically identify and address learning gaps down to elementary-level content, using adaptive remediation to bring students to grade-level no matter where they start. Students engage with the content in an interactive, feedback-rich environment as they progress through standards-aligned modules. By constantly honing the ability to apply their knowledge in abstract and real world scenarios, students build the depth of knowledge and higher order skills required to demonstrate their mastery when put to the test.

In each module, the Learn It and Try It make complex ideas accessible to students through focused content, modeled logic and process, multi-modal representations, and personalized feedback as students reason through increasingly challenging problems. The Review It offers a high impact summary of key concepts and relates those concepts to students' lives. The Test It assesses students' mastery of the module's concepts, providing granular performance data to students and teachers after each attempt. To help students focus on the content most relevant to them, unit-level pretests and posttests can quickly identify where students are strong and where they're still learning.

1. NUMBER SENSE

- **APPROXIMATING IRRATIONAL NUMBERS**
  - **2.B** *approximate the value of an irrational number, including π and square roots of numbers less than 225, and locate that rational number approximation on a number line;*
  - **2.D** *order a set of real numbers arising from mathematical and real-world contexts.*

- **RATIONAL AND IRRATIONAL NUMBERS**
  - **2.A** *extend previous knowledge of sets and subsets using a visual representation to describe relationships between sets of real numbers;*

- **SCIENTIFIC NOTATION**
  - **2.C** *convert between standard decimal notation and scientific notation; and*

2. FUNCTIONS AND SLOPE

- **SLOPE**
  - **4.A** *use similar right triangles to develop an understanding that slope, m, given as the rate comparing the change in y-values to the change in x-values, $(y_2 - y_1)/(x_2 - x_1)$, is the same for any two points (x_1, y_1) and (x_2, y_2) on the same line;*
  - **4.B** *graph proportional relationships, interpreting the unit rate as the slope of the line that models the relationship; and*
  - **4.C** *use data from a table or graph to determine the rate of change or slope and y-intercept in mathematical and real-world problems.*
  - **1.B** *use a problem-solving model that incorporates analyzing given information, formulating a plan or strategy, determining a solution, justifying the solution, and evaluating the problem-solving process and the reasonableness of the solution;*
  - **5.A** *represent linear proportional situations with tables, graphs, and equations in the form of $y = kx$;*
  - **5.I** *write an equation in the form $y = mx + b$ to model a linear relationship between two quantities using verbal, numerical, tabular, and graphical representations.*

- **RELATIONS AND FUNCTIONS**

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- **RELATIONS AND FUNCTIONS**
  - **5.G** *identify functions using sets of ordered pairs, tables, mappings, and graphs;*

3. PROPORTIONAL REASONING

- **IDENTIFYING PROPORTIONAL RELATIONSHIPS**
  - **5.F** *distinguish between proportional and non-proportional situations using tables, graphs, and equations in the form* $y = kx$ *or* $y = mx + b$*, where* $b \neq 0$*;*
  - **5.H** *identify examples of proportional and non-proportional functions that arise from mathematical and real-world problems; and*
  - **5.A** *represent linear proportional situations with tables, graphs, and equations in the form of* $y = kx$*;*

- **MULTIPLE REPRESENTATIONS OF PROPORTIONS**
  - **4.B** *graph proportional relationships, interpreting the unit rate as the slope of the line that models the relationship; and*
  - **5.A** *represent linear proportional situations with tables, graphs, and equations in the form of* $y = kx$*;*
  - **5.E** *solve problems involving direct variation;*
  - **5.H** *identify examples of proportional and non-proportional functions that arise from mathematical and real-world problems; and*

- **COMPARING FUNCTIONS**
  - **4.C** *use data from a table or graph to determine the rate of change or slope and* y*-intercept in mathematical and real-world problems.*
  - **5.G** *identify functions using sets of ordered pairs, tables, mappings, and graphs;*
  - **1.D** *communicate mathematical ideas, reasoning, and their implications using multiple representations, including symbols, diagrams, graphs, and language as appropriate;*
  - **5.H** *identify examples of proportional and non-proportional functions that arise from mathematical and real-world problems; and*

4. LINEAR FUNCTIONS

- **SLOPE-INTERCEPT FORM**
  - **5.I** *write an equation in the form* $y = mx + b$ *to model a linear relationship between two quantities using verbal, numerical, tabular, and graphical representations.*
  - **4.C** *use data from a table or graph to determine the rate of change or slope and* y*-intercept in mathematical and real-world problems.*
  - **5.F** *distinguish between proportional and non-proportional situations using tables, graphs, and equations in the form* $y = kx$ *or* $y = mx + b$*, where* $b \neq 0$*;*
  - **5.H** *identify examples of proportional and non-proportional functions that arise from mathematical and real-world problems; and*
  - **5.B** *represent linear non-proportional situations with tables, graphs, and equations in the form of* $y = mx+b$*, where* $b \neq 0$*;*
  - **5.G** *identify functions using sets of ordered pairs, tables, mappings, and graphs;*

- **WRITING LINEAR FUNCTIONS**
  - **1.D** *communicate mathematical ideas, reasoning, and their implications using multiple representations, including symbols, diagrams, graphs, and language as appropriate;*
  - **1.E** *create and use representations to organize, record, and communicate mathematical ideas;*
  - **5.H** *identify examples of proportional and non-proportional functions that arise from mathematical and real-world problems; and*
  - **1.A** *apply mathematics to problems arising in everyday life, society, and the workplace;*
  - **5.B** *represent linear non-proportional situations with tables, graphs, and equations in the form of* $y = mx+b$*, where* $b \neq 0$*;*
  - **5.I** *write an equation in the form* $y = mx + b$ *to model a linear relationship between two quantities using verbal, numerical, tabular, and graphical representations.*

- **SOLVING SYSTEMS OF LINEAR EQUATIONS**

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- **9** *The student applies mathematical process standards to use multiple representations to develop foundational concepts of simultaneous linear equations. The student is expected to identify and verify the values of x and y that simultaneously satisfy two linear equations in the form $y = mx + b$ from the intersections of the graphed equations.*

5. THE PYTHAGOREAN THEOREM

- **THE PYTHAGOREAN THEOREM**
  - **1.F** *analyze mathematical relationships to connect and communicate mathematical ideas; and*
  - **6.C** *use models and diagrams to explain the Pythagorean theorem.*
  - **7.C** *use the Pythagorean Theorem and its converse to solve problems; and*
  - **1.C** *select tools, including real objects, manipulatives, paper and pencil, and technology as appropriate, and techniques, including mental math, estimation, and number sense as appropriate, to solve problems;*
  - **1.E** *create and use representations to organize, record, and communicate mathematical ideas;*

- **THE CONVERSE OF THE PYTHAGOREAN THEOREM**
  - **1.F** *analyze mathematical relationships to connect and communicate mathematical ideas; and*
  - **6.C** *use models and diagrams to explain the Pythagorean theorem.*
  - **7.C** *use the Pythagorean Theorem and its converse to solve problems; and*
  - **7.D** *determine the distance between two points on a coordinate plane using the Pythagorean Theorem.*

6. GEOMETRY IN TWO AND THREE DIMENSIONS

- **AREA, VOLUME, AND SURFACE AREA**
  - **7.B** *use previous knowledge of surface area to make connections to the formulas for lateral and total surface area and determine solutions for problems involving rectangular prisms, triangular prisms, and cylinders;*

- **VOLUME OF CYLINDERS AND CONES**
  - **6.A** *describe the volume formula $V = Bh$ of a cylinder in terms of its base area and its height;*
  - **7.A** *solve problems involving the volume of cylinders, cones, and spheres;*
  - **1.A** *apply mathematics to problems arising in everyday life, society, and the workplace;*
  - **6.B** *model the relationship between the volume of a cylinder and a cone having both congruent bases and heights and connect that relationship to the formulas; and*
  - **1.B** *use a problem-solving model that incorporates analyzing given information, formulating a plan or strategy, determining a solution, justifying the solution, and evaluating the problem-solving process and the reasonableness of the solution;*
  - **1.C** *select tools, including real objects, manipulatives, paper and pencil, and technology as appropriate, and techniques, including mental math, estimation, and number sense as appropriate, to solve problems;*

- **SPHERES**
  - **7.A** *solve problems involving the volume of cylinders, cones, and spheres;*
  - **1.A** *apply mathematics to problems arising in everyday life, society, and the workplace;*
  - **1.B** *use a problem-solving model that incorporates analyzing given information, formulating a plan or strategy, determining a solution, justifying the solution, and evaluating the problem-solving process and the reasonableness of the solution;*
  - **1.C** *select tools, including real objects, manipulatives, paper and pencil, and technology as appropriate, and techniques, including mental math, estimation, and number sense as appropriate, to solve problems;*

7. CONGRUENCE AND SIMILARITY TRANSFORMATIONS

- **BASICS OF TRANSFORMATIONS**
  - **10.A** *generalize the properties of orientation and congruence of rotations, reflections, translations, and dilations of two-dimensional shapes on a coordinate plane;*
  - **3.A** *generalize that the ratio of corresponding sides of similar shapes are proportional, including a shape and its dilation;*
  - **10.B** *differentiate between transformations that preserve congruence and those that do not;*

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- **10.C** *explain the effect of translations, reflections over the x- or y-axis, and rotations limited to 90°, 180°, 270°, and 360° as applied to two-dimensional shapes on a coordinate plane using an algebraic representation; and*

- **TRANSFORMATIONS ON THE COORDINATE PLANE**
  - **10.A** *generalize the properties of orientation and congruence of rotations, reflections, translations, and dilations of two-dimensional shapes on a coordinate plane;*
  - **10.C** *explain the effect of translations, reflections over the x- or y-axis, and rotations limited to 90°, 180°, 270°, and 360° as applied to two-dimensional shapes on a coordinate plane using an algebraic representation; and*
  - **10.B** *differentiate between transformations that preserve congruence and those that do not;*
  - **3.B** *compare and contrast the attributes of a shape and its dilation(s) on a coordinate plane; and*
  - **1.D** *communicate mathematical ideas, reasoning, and their implications using multiple representations, including symbols, diagrams, graphs, and language as appropriate;*
  - **1.G** *display, explain, and justify mathematical ideas and arguments using precise mathematical language in written or oral communication.*

- **SIMILARITY AND DILATIONS**
  - **3.A** *generalize that the ratio of corresponding sides of similar shapes are proportional, including a shape and its dilation;*
  - **3.C** *use an algebraic representation to explain the effect of a given positive rational scale factor applied to two-dimensional figures on a coordinate plane with the origin as the center of dilation.*
  - **10.B** *differentiate between transformations that preserve congruence and those that do not;*
  - **3.B** *compare and contrast the attributes of a shape and its dilation(s) on a coordinate plane; and*
  - **10.A** *generalize the properties of orientation and congruence of rotations, reflections, translations, and dilations of two-dimensional shapes on a coordinate plane;*
  - **1.D** *communicate mathematical ideas, reasoning, and their implications using multiple representations, including symbols, diagrams, graphs, and language as appropriate;*
  - **1.G** *display, explain, and justify mathematical ideas and arguments using precise mathematical language in written or oral communication.*
  - **7.C** *use the Pythagorean Theorem and its converse to solve problems; and*

8. ANGLES AND ANGLE RELATIONSHIPS

- **PARALLEL LINES AND ANGLE RELATIONSHIPS**
  - **8.D** *use informal arguments to establish facts about the angle sum and exterior angle of triangles, the angles created when parallel lines are cut by a transversal, and the angle-angle criterion for similarity of triangles.*
  - **1.F** *analyze mathematical relationships to connect and communicate mathematical ideas; and*

- **ANGLE RELATIONSHIPS IN TRIANGLES**
  - **1.F** *analyze mathematical relationships to connect and communicate mathematical ideas; and*
  - **8.D** *use informal arguments to establish facts about the angle sum and exterior angle of triangles, the angles created when parallel lines are cut by a transversal, and the angle-angle criterion for similarity of triangles.*

9. STATISTICS 1

- **SCATTERPLOTS**
  - **11.A** *construct a scatterplot and describe the observed data to address questions of association such as linear, non-linear, and no association between bivariate data;*
  - **5.C** *contrast bivariate sets of data that suggest a linear relationship with bivariate sets of data that do not suggest a linear relationship from a graphical representation;*

- **LINEAR MODELS IN DATA**
  - **5.C** *contrast bivariate sets of data that suggest a linear relationship with bivariate sets of data that do not suggest a linear relationship from a graphical representation;*
  - **5.D** *use a trend line that approximates the linear relationship between bivariate sets of data to make predictions;*

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- **11.A** *construct a scatterplot and describe the observed data to address questions of association such as linear, non-linear, and no association between bivariate data;*
- **4.C** *use data from a table or graph to determine the rate of change or slope and y-intercept in mathematical and real-world problems.*

10. STATISTICS 2

- **USING STATISTICAL MEASURES TO COMPARE DATA SETS**
  - **11.B** *determine the mean absolute deviation and use this quantity as a measure of the average distance data are from the mean using a data set of no more than 10 data points; and*
  - **1.E** *create and use representations to organize, record, and communicate mathematical ideas;*

- **POPULATIONS AND SAMPLES**
  - **11.C** *simulate generating random samples of the same size from a population with known characteristics to develop the notion of a random sample being representative of the population from which it was selected.*

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