

# The Quantile Framework<sup>®</sup> for Mathematics

EM 100Q 200Q 300Q 400Q 500Q 600Q 700Q 800Q 900Q 1000Q 1100Q 1200Q 1300Q

## GEOMETRY

250Q Recognize and draw plane figures: hexagons, trapezoids, and parallelograms.

400Q Identify intersecting, parallel, and perpendicular lines and line segments and their midpoints; identify in the environment.

450Q Use manipulatives, pictorial representations, and appropriate vocabulary (e.g., polygon, side, angle, and vertex) to identify properties of plane figures; identify in the environment.

530Q Identify angles (acute, right, and obtuse); identify in the environment.

680Q Identify rotational symmetry and distinguish between types of symmetry.

770Q Identify and distinguish among similar, congruent, and symmetric figures; name corresponding parts.

880Q Using three-dimensional figures, describe cross-sectional views.

920Q Identify and describe the intersection of figures in a plane. Solve problems.

1030Q Define and identify interior, exterior, complementary, and supplementary angles and pairs of skew lines.

1070Q Draw conclusions about the sum of the measures of the interior angles of quadrilaterals and triangles.

## MEASUREMENT

250Q Estimate and measure length (feet, yards, meters) using appropriate tools and units.

380Q Read Celsius and Fahrenheit thermometers; relate temperatures to everyday situations.

420Q Measure the perimeter of rectangles and triangles. Determine the area of rectangles and squares using grids; find areas of other regular and irregular figures using grids.

820Q Calculate the volume of rectangular solids.

930Q Investigate and determine the relationship between the diameter and the circumference of a circle and the value of pi; calculate the circumference of a circle.

950Q Calculate the areas of triangles, parallelograms, and circles.

990Q Use proportions to express relationships between corresponding parts of similar figures, including scale drawings.

1120Q Use models (nets) to find the surface area of rectangular solids and cylinders.

1220Q Use formulas to solve problems related to the lateral area, surface area, and volume of a right prism, pyramid, right circular cylinder, cone, and sphere.

## NUMBERS AND OPERATIONS

70Q Subtract 2- and 3-digit numbers without regrouping.

240Q Model and explain multiplication in a variety of ways, including repeated addition, rectangular arrays, and skip counting.

290Q Subtract 2- and 3-digit numbers with regrouping.

470Q Use concepts of negative numbers (e.g., on a number line, in counting, in temperature, in "owing").

500Q Read, write, estimate, and compare numbers with place values between thousandths and millions in a variety of situations.

580Q Estimate results and compute sums and differences with decimal numbers (tenths, hundredths, thousandths).

660Q Use the order of operations to simplify numerical expressions with parentheses and exponents.

720Q Use models and pictures to add and subtract fractions and mixed numbers with unlike denominators; record solutions.

870Q Estimate and solve problems with ratio, proportion, and percent, including discounts, taxes, commissions, and simple interest.

880Q Add and subtract with fractions and mixed numbers that have unlike denominators.

1050Q Add, subtract, and multiply polynomials.

## ALGEBRA / PATTERNS & FUNCTIONS

70Q Define pattern units; translate into other forms.

150Q Find the value of an unknown in a number sentence.

160Q Identify and correct errors in numerical and geometric patterns.

210Q Identify classification and patterning in the environment.

360Q Describe and demonstrate patterns in skip counting and multiplication; continue sequences beyond memorized or modeled numbers.

420Q Use symbols to represent unknown quantities in number sentences.

470Q Analyze patterns and describe the rule; translate the same pattern into another pattern (e.g., from letters to numbers).

530Q Identify, describe, and generalize relationships in which quantities change proportionally. Use relationships to describe and determine constant rate of change.

620Q Use algebraic expressions, patterns, and one-step equations and inequalities to model and solve problems.

780Q Identify, describe, and analyze situations with constant or varying rates of change.

800Q Model and solve one-step and two-step equations and inequalities and graph their solutions.

810Q Use graphs, tables, and symbols to model and solve problems involving rates of change and ratios.

820Q Write or model a simple linear equation to solve a given problem.

1090Q Find and interpret the maximum and minimum values and the intercepts of a quadratic function.

1120Q Use logarithmic and exponential functions; solve by graphing.

1350Q Use equations which contain radical expressions to solve problems; solve by graphing.

## DATA ANALYSIS & PROBABILITY

370Q Name the ordered pair for a point on the grid; plot positions named by ordered pairs on a coordinate grid (Quadrant I).

440Q Use a fraction to describe the probability of an event and report the outcome of the experiment.

600Q Display data using circle graphs.

830Q Determine and compare experimental results and theoretical probabilities for simple and compound events; record and explain results.

1050Q Identify outliers and determine their effect on the mean, median, mode, and range of a set of data.

1100Q Write a linear equation which models a set of real data.

1230Q Use length, area, and volume to solve problems involving probability.

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### About The Quantile Framework<sup>®</sup> for Mathematics

The Quantile Framework provides a common scale for measuring mathematics achievement and concept/application solvability. Quantile<sup>®</sup> measures enable educators to monitor student progress in mathematics and to relate the measures to end-of-year test scores. The Quantile scale uses "QTaxons" to locate a student's ability to think mathematically in a taxonomy of math skills, concepts and applications.

Each QTaxon is linked to one of the five strands—Geometry, Measurement, Numbers and Operations, Algebra/Patterns & Functions, and Data Analysis & Probability. The Quantile strands integrate and align with the strands described by the National Council of Teachers of Mathematics (NCTM), including representation, reasoning and proof, communication, connections and problem solving.

Emerging Mathematician (EM) is associated with Quantile measures of 0Q and below.

The Quantile Framework was developed by MetaMetrics<sup>®</sup>, Inc., an independent education company based in Durham, NC. For more information, call 1.888.539.4537 or visit [www.Quantiles.com](http://www.Quantiles.com).

The QTaxon database contains more than 500 QTaxons that span the developmental continuum from kindergarten mathematics through the content typically taught in Algebra II, Geometry, Trigonometry and Pre-calculus. The QTaxons shown are exemplary QTaxons from the database.

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Quantile: More than a number

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