| **Test Content Categories** | **Required Course Numbers** | | | | | | | | | |
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| **I. Numbers and Operations (42%)** |  |  |  |  |  |  |  |  |  |  |
| **A. Understands the Place-Value System** |  |  |  |  |  |  |  |  |  |  |
| 1. Represents numbers using base-10 model, standard form (numerals), written form (number names), and expanded form |  |  |  |  |  |  |  |  |  |  |
| 1. Composes and decomposes multidigit numbers |  |  |  |  |  |  |  |  |  |  |
| 1. Identifies the place a digit is in and its value in that place |  |  |  |  |  |  |  |  |  |  |
| 1. Uses whole-number exponents to denote powers of 10 and recognizes that a digit in one place represents ten times what it represents in the place to its right and one-tenth what it represents in the place to its left, and extends this recognition to several places to the right or left |  |  |  |  |  |  |  |  |  |  |
| **B. Understands Operations and Properties of Rational Numbers** |  |  |  |  |  |  |  |  |  |  |
| 1. Uses concepts of one-to-one correspondence, counting, skip counting, and cardinality to solve problems |  |  |  |  |  |  |  |  |  |  |
| 1. Identifies different problem situations for the operations (e.g., addition as putting together, subtraction as a comparison, multiplication as equal groups, repeated addition, arrays, division as sharing, repeated subtraction) |  |  |  |  |  |  |  |  |  |  |
| 1. Solves multistep mathematical and real-world problems using addition, subtraction, multiplication, and division of rational numbers; interprets the solutions of the problems (e.g., remainders) |  |  |  |  |  |  |  |  |  |  |
| 1. Uses various strategies and algorithms to perform operations on rational numbers |  |  |  |  |  |  |  |  |  |  |
| 1. Uses mental computation, estimation, and rounding strategies to solve problems and to determine reasonableness of the results |  |  |  |  |  |  |  |  |  |  |
| 1. Solves problems using the order of operations, including problems involving whole-number exponents |  |  |  |  |  |  |  |  |  |  |
| 1. Identifies properties of operations (e.g., commutative, associative, distributive) and uses them to solve problems |  |  |  |  |  |  |  |  |  |  |
| 1. Solves problems involving odd and even numbers, prime and composite numbers, factors, and multiples of numbers |  |  |  |  |  |  |  |  |  |  |
| 1. Applies concepts of fractions (e.g., fractions as numbers less than 1 and greater than 1, as part-whole relationships, as multiples of unit fractions, and as division; equipartitioning; equivalent fractions; the fact that the value of a unit fraction decreases as the value of the denominator increases; the fact that fraction comparisons are valid only when the fractions refer to the same whole) to solve problems |  |  |  |  |  |  |  |  |  |  |
| 1. Represents rational numbers and operations on rational numbers in different ways (e.g., base-10 blocks, equations, number lines, rectangular arrays, area models) |  |  |  |  |  |  |  |  |  |  |
| 1. Compares, classifies, and orders rational numbers |  |  |  |  |  |  |  |  |  |  |
| 1. Converts between fractions and decimals |  |  |  |  |  |  |  |  |  |  |
| **C. Understands Ratios, Proportional Relationships, and Percents** |  |  |  |  |  |  |  |  |  |  |
| 1. Finds a percent of a quantity as a rate per 100 |  |  |  |  |  |  |  |  |  |  |
| 1. Uses the language of ratio and rate to describe relationships between two quantities |  |  |  |  |  |  |  |  |  |  |
| 1. Identifies proportional relationships and uses them to solve problems (e.g., unit rates) |  |  |  |  |  |  |  |  |  |  |
| **II. Algebraic Thinking (29%)** |  |  |  |  |  |  |  |  |  |  |
| **A. Knows How to Create, Evaluate, and Manipulate Algebraic Expressions, Equations, Inequalities, and Formulas** |  |  |  |  |  |  |  |  |  |  |
| 1. Recognizes the meaning of the equal sign and what it means for algebraic expressions and equations to be considered equivalent |  |  |  |  |  |  |  |  |  |  |
| 1. Differentiates among algebraic expressions, equations, and inequalities |  |  |  |  |  |  |  |  |  |  |
| 1. Identifies equivalent linear algebraic expressions by adding and subtracting like terms and using the distributive property |  |  |  |  |  |  |  |  |  |  |
| 1. Evaluates simple algebraic expressions (i.e., one variable with up to 2 terms) for given values of variables |  |  |  |  |  |  |  |  |  |  |
| 1. Uses mathematical terms to identify parts of expressions and describe expressions (i.e., sum, difference, product, quotient, factor, term, coefficient, variable, constant term) |  |  |  |  |  |  |  |  |  |  |
| 1. Translates between verbal statements and algebraic expressions, equations, or inequalities |  |  |  |  |  |  |  |  |  |  |
| 1. Solves multistep one-variable linear equations and inequalities |  |  |  |  |  |  |  |  |  |  |
| 1. Interprets solutions of multistep one-variable linear equations and inequalities (e.g., graphs the solution on a number line, interprets a solution in context) |  |  |  |  |  |  |  |  |  |  |
| 1. Uses formulas to determine unknown quantities |  |  |  |  |  |  |  |  |  |  |
| **B. Knows How to Recognize and Represent Linear Relationships** |  |  |  |  |  |  |  |  |  |  |
| 1. Identifies, extends, describes, and generates number and shape patterns that increase or decrease linearly |  |  |  |  |  |  |  |  |  |  |
| 1. Finds a rule or relationship between the corresponding terms of two linear numerical patterns |  |  |  |  |  |  |  |  |  |  |
| 1. Uses linear relationships represented by equations, tables, and graphs to solve problems |  |  |  |  |  |  |  |  |  |  |
| **III. Geometry, Measurement, and Data (29%)** |  |  |  |  |  |  |  |  |  |  |
| **A. Knows Concepts of Geometry** |  |  |  |  |  |  |  |  |  |  |
| 1. Uses definitions to identify lines, rays, line segments, parallel lines, and perpendicular lines |  |  |  |  |  |  |  |  |  |  |
| 1. Classifies angles based on their measures |  |  |  |  |  |  |  |  |  |  |
| 1. Composes and decomposes two- and three-dimensional shapes |  |  |  |  |  |  |  |  |  |  |
| 1. Classifies polygons and solids using their properties |  |  |  |  |  |  |  |  |  |  |
| 1. Identifies lines of symmetry and line-symmetric polygons |  |  |  |  |  |  |  |  |  |  |
| 1. Solves problems by plotting points and drawing polygons in the xy-plane |  |  |  |  |  |  |  |  |  |  |
| **B. Knows Concepts of Measurement** |  |  |  |  |  |  |  |  |  |  |
| 1. Finds the area and perimeter of polygons, including those with fractional side lengths |  |  |  |  |  |  |  |  |  |  |
| 1. Finds the volume and surface area of right rectangular prisms, including those with fractional edge lengths |  |  |  |  |  |  |  |  |  |  |
| 1. Represents three-dimensional figures with nets that are made of rectangles and triangles and uses nets to determine the surface area of three-dimensional figures |  |  |  |  |  |  |  |  |  |  |
| 1. Calculates changes to perimeter, area, and volume as dimensions change |  |  |  |  |  |  |  |  |  |  |
| 1. Solves measurement and conversion problems involving money, length, volume, mass, and elapsed time in standard measurement systems |  |  |  |  |  |  |  |  |  |  |
| 1. Selects appropriate tools to measure the attributes of objects |  |  |  |  |  |  |  |  |  |  |
| **C. Knows Basic Concepts of Data** |  |  |  |  |  |  |  |  |  |  |
| 1. Collects data using appropriate statistical questions to identify, construct, and complete graphs that correctly represent the data (e.g., circle graphs, bar graphs, line graphs, histograms, scatterplots, double bar graphs, double line graphs, box plots, line plots/dot plots) |  |  |  |  |  |  |  |  |  |  |
| 1. Interprets various displays of data (e.g., box plots, histograms, scatterplots) |  |  |  |  |  |  |  |  |  |  |
| 1. Describes a set of data using measures of center (e.g., mean, median), measures of spread (e.g., range, interquartile range), and shape |  |  |  |  |  |  |  |  |  |  |
| 1. Determines how changes in data affect measures of center and measures of spread |  |  |  |  |  |  |  |  |  |  |
| **Tasks of Teaching Mathematics** |  |  |  |  |  |  |  |  |  |  |
| **Instruction** |  |  |  |  |  |  |  |  |  |  |
| 1. Evaluates mathematical language (e.g., explanations, justifications, definitions) to determine its validity, generalizability, coherence, precision, usefulness in a particular context, or how it can be improved |  |  |  |  |  |  |  |  |  |  |
| 1. Identifies problems, tasks, examples, and questions that fit a particular structure, illustrate a concept, demonstrate desired characteristics, or are useful for introducing a concept |  |  |  |  |  |  |  |  |  |  |
| 1. Identifies problems, tasks, examples, or questions that incorporate mathematical practices (e.g., constructing viable arguments, modeling with mathematics, attending to precision) |  |  |  |  |  |  |  |  |  |  |
| 1. Identifies problems, tasks, examples, and questions that support a strategy or address a student question or misconception |  |  |  |  |  |  |  |  |  |  |
| 1. Identifies counterexamples that highlight a mathematical distinction or demonstrate why a student conjecture is incorrect or partially incorrect |  |  |  |  |  |  |  |  |  |  |
| 1. Evaluates representations (e.g., visual, physical, symbolic) in terms of validity, generalizability, usefulness for supporting students’ understanding, or fit to the content being represented |  |  |  |  |  |  |  |  |  |  |
| **B. Student Reasoning** |  |  |  |  |  |  |  |  |  |  |
| 1. Evaluates and compares student work (e.g., solutions, conjectures, explanations, justifications, generalizations, representations) in terms of validity, generalizability, coherence, or precision |  |  |  |  |  |  |  |  |  |  |
| 1. Evaluates student work to identify the use of a particular concept, idea, or strategy |  |  |  |  |  |  |  |  |  |  |