

College Readiness Standards — Mathematics

| | Basic Operations & Applications | Probability, Statistics, & Data Analysis | Numbers: Concepts & Properties | Expressions, Equations, & Inequalities |
|-------------------|--|--|---|---|
| 13–15 | Perform one-operation computation with whole numbers and decimals Solve problems in one or two steps using whole numbers Perform common conversions (e.g., inches to feet or hours to minutes) | Calculate the average of a list of positive whole numbers Perform a single computation using information from a table or chart | Recognize equivalent fractions and fractions in lowest terms | Exhibit knowledge of basic expressions (e.g., identify an expression for a total as $b + g$) Solve equations in the form $x + a = b$, where a and b are whole numbers or decimals |
| 16–19 | Solve routine one-step arithmetic problems (using whole numbers, fractions, and decimals) such as single-step percent Solve some routine two-step arithmetic problems | Calculate the average of a list of numbers Calculate the average, given the number of data values and the sum of the data values Read tables and graphs Perform computations on data from tables and graphs Use the relationship between the probability of an event and the probability of its complement | Recognize one-digit factors of a number Identify a digit's place value | Substitute whole numbers for unknown quantities to evaluate expressions Solve one-step equations having integer or decimal answers Combine like terms (e.g., $2x + 5x$) |
| 20–23 | Solve routine two-step or three-step arithmetic problems involving concepts such as rate and proportion, tax added, percentage off, and computing with a given average | Calculate the missing data value, given the average and all data values but one Translate from one representation of data to another (e.g., a bar graph to a circle graph) Determine the probability of a simple event Exhibit knowledge of simple counting techniques* | Exhibit knowledge of elementary number concepts including rounding, the ordering of decimals, pattern identification, absolute value, primes, and greatest common factor | Evaluate algebraic expressions by substituting integers for unknown quantities Add and subtract simple algebraic expressions Solve routine first-degree equations Perform straightforward word-to-symbol translations Multiply two binomials* |
| 24–27 | Solve multistep arithmetic problems that involve planning or converting units of measure (e.g., feet per second to miles per hour) | Calculate the average, given the frequency counts of all the data values Manipulate data from tables and graphs Compute straightforward probabilities for common situations Use Venn diagrams in counting* | Find and use the least common multiple Order fractions Work with numerical factors Work with scientific notation Work with squares and square roots of numbers Work problems involving positive integer exponents* Work with cubes and cube roots of numbers* Determine when an expression is undefined* Exhibit some knowledge of the complex numbers† | Solve real-world problems using first-degree equations Write expressions, equations, or inequalities with a single variable for common pre-algebra settings (e.g., rate and distance problems and problems that can be solved by using proportions) Identify solutions to simple quadratic equations Add, subtract, and multiply polynomials* Factor simple quadratics (e.g., the difference of squares and perfect square trinomials)* Solve first-degree inequalities that do not require reversing the inequality sign* |
| 28–32 * | Solve word problems containing several rates, proportions, or percentages | Calculate or use a weighted average Interpret and use information from figures, tables, and graphs Apply counting techniques Compute a probability when the event and/or sample space are not given or obvious | Apply number properties involving prime factorization Apply number properties involving even/odd numbers and factors/multiples Apply number properties involving positive/negative numbers Apply rules of exponents Multiply two complex numbers† | Manipulate expressions and equations Write expressions, equations, and inequalities for common algebra settings Solve linear inequalities that require reversing the inequality sign Solve absolute value equations Solve quadratic equations Find solutions to systems of linear equations |
| 33–36 † | Solve complex arithmetic problems involving percent of increase or decrease and problems requiring integration of several concepts from pre-algebra and/or pre-geometry (e.g., comparing percentages or averages, using several ratios, and finding ratios in geometry settings) | Distinguish between mean, median, and mode for a list of numbers Analyze and draw conclusions based on information from figures, tables, and graphs Exhibit knowledge of conditional and joint probability | Draw conclusions based on number concepts, algebraic properties, and/or relationships between expressions and numbers Exhibit knowledge of logarithms and geometric sequences Apply properties of complex numbers | Write expressions that require planning and/or manipulating to accurately model a situation Write equations and inequalities that require planning, manipulating, and/or solving Solve simple absolute value inequalities |

* Statements apply to PLAN & ACT only

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College Readiness Standards — Mathematics (continued)

| | Graphical Representations | Properties of Plane Figures | Measurement | Functions† |
|-------------------|---|--|---|---|
| 13–15 | Identify the location of a point with a positive coordinate on the number line | | Estimate or calculate the length of a line segment based on other lengths given on a geometric figure | |
| 16–19 | Locate points on the number line and in the first quadrant | Exhibit some knowledge of the angles associated with parallel lines | Compute the perimeter of polygons when all side lengths are given Compute the area of rectangles when whole number dimensions are given | |
| 20–23 | Locate points in the coordinate plane Comprehend the concept of length on the number line* Exhibit knowledge of slope* | Find the measure of an angle using properties of parallel lines Exhibit knowledge of basic angle properties and special sums of angle measures (e.g., 90°, 180°, and 360°) | Compute the area and perimeter of triangles and rectangles in simple problems Use geometric formulas when all necessary information is given | Evaluate quadratic functions, expressed in function notation, at integer values |
| 24–27 | Identify the graph of a linear inequality on the number line* Determine the slope of a line from points or equations* Match linear graphs with their equations* Find the midpoint of a line segment* | Use several angle properties to find an unknown angle measure Recognize Pythagorean triples* Use properties of isosceles triangles* | Compute the area of triangles and rectangles when one or more additional simple steps are required Compute the area and circumference of circles after identifying necessary information Compute the perimeter of simple composite geometric figures with unknown side lengths* | Evaluate polynomial functions, expressed in function notation, at integer values Express the sine, cosine, and tangent of an angle in a right triangle as a ratio of given side lengths |
| 28–32 * | Interpret and use information from graphs in the coordinate plane Match number line graphs with solution sets of linear inequalities Use the distance formula Use properties of parallel and perpendicular lines to determine an equation of a line or coordinates of a point Recognize special characteristics of parabolas and circles (e.g., the vertex of a parabola and the center or radius of a circle)† | Apply properties of 30°–60°–90°, 45°–45°–90°, similar, and congruent triangles Use the Pythagorean theorem | Use relationships involving area, perimeter, and volume of geometric figures to compute another measure | Evaluate composite functions at integer values Apply basic trigonometric ratios to solve right-triangle problems |
| 33–36 † | Match number line graphs with solution sets of simple quadratic inequalities Identify characteristics of graphs based on a set of conditions or on a general equation such as $y = ax^2 + c$ Solve problems integrating multiple algebraic and/or geometric concepts Analyze and draw conclusions based on information from graphs in the coordinate plane | Draw conclusions based on a set of conditions Solve multistep geometry problems that involve integrating concepts, planning, visualization, and/or making connections with other content areas Use relationships among angles, arcs, and distances in a circle | Use scale factors to determine the magnitude of a size change Compute the area of composite geometric figures when planning or visualization is required | Write an expression for the composite of two simple functions Use trigonometric concepts and basic identities to solve problems Exhibit knowledge of unit circle trigonometry Match graphs of basic trigonometric functions with their equations |

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