ACT Standards for Pre-Algebra

Numbers: Concepts & Properties
- Recognize one-digit factors of a number
- Identify a digit's place value

ACT Standards for Algebra I

Basic Operations and Applications
- Solve routine one-step arithmetic problems (using whole numbers, fractions, and decimals) such as single-step percent and calculate a simple average of whole numbers
- Solve some routine two-step arithmetic problems
- Solve routine two-step or three-step arithmetic problems involving concepts such as rate and proportion, tax added, percentage off, computing an average with negative integers, and computing with a given average
- Solve multi-step arithmetic problems that involve planning or converting units of measure (e.g., feet per second to miles per hour)
- Solve word problems containing several rates, proportions, or percentages
- 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)

Probability, Statistics, & Data Analysis
- 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
- 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
- Manipulate data from tables and graphs
- Use Venn diagrams in counting
- Compute straightforward probabilities for common situations
- Interpret and use information from figures, tables, and graphs, including graphs in the coordinate plane
- Apply counting techniques
- Compute a probability when the event and/or sample space are not given or obvious
- Analyze and draw conclusions based on information from figures, tables, and graphs, including graphs in the coordinate plane

Numbers: Concepts & Properties
- Exhibit knowledge of elementary number concepts including rounding, the ordering of decimals, pattern identification, absolute value, primes, and greatest common factor
- Work problems involving [positive integer exponents], scientific notation, ordering fractions, numerical factors, least common multiple, square roots, [and cube roots]
- Determine when an expression is undefined
- Square numbers [and expressions]

Algebraic Expressions
- Combine like terms (e.g., $2x + 5x$)
- Substitute whole numbers for unknown quantities to evaluate expressions
- Manipulate basic algebraic expressions (e.g., substitute integers for unknown quantities, add and subtract simple algebraic expressions, [multiply two binomials], and perform straightforward word-to-symbol translations)
- Factor simple quadratics (e.g., the difference of squares and perfect square trinomials)
- Add, subtract, and multiply polynomials
- Write expressions with a single variable for common pre-algebra settings (e.g., rate and distance problems and problems that can be solved by using proportions)

Equations & Inequalities
- Solve one-step equations having integer or decimal answers
- Solve routine first-degree equations
- Solve real-world problems using first-degree equations
- Solve first-degree inequalities that do not require reversing the inequality sign
- Identify solutions to simple quadratic equations
- Write equations and 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)
- Manipulate equations
- Write equations and inequalities for common algebra settings
- Solve linear inequalities that require reversing the inequality sign
- Find solutions to systems of linear equations
- Solve simple absolute value inequalities

Graphical Representations
- Locate points on the number line and in the first quadrant
- Comprehend the concept of length on the number line
- Locate points in the coordinate plane
- Exhibit knowledge of vertical and horizontal lines and of their point of intersection
- Exhibit knowledge of slope
- 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
- Match number line graphs with solution sets of linear inequalities
- Use the distance formula

Measurement
- Compute the perimeter of polygons when all side lengths are given
- Compute the area of rectangles when whole number dimensions are given

ACT Standards for Geometry

Graphical Representations
- Use properties of parallel and perpendicular lines to determine an equation of a line or coordinates of a point

Properties of Plan Figures
- Exhibit knowledge of basic angle properties and special sums of angle measures (e.g., 90°, 180°, and 360°)
- Use properties of isosceles triangles
- Recognize Pythagorean triples
- Use several angle properties to find an unknown angle measure
- Apply properties of 30°-60°-90°, 45°-45°-90°, similar, and congruent triangles
- Use the Pythagorean theorem
- Draw conclusions based on a set of conditions
- Solve multi-step 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

Measurement
- Compute areas and circumferences of circles after identifying necessary information
- Compute areas of rectangles and triangles when one or more additional simple steps are required
- Compute the perimeter of simple composite geometric figures with unknown side lengths
- Use relationships involving area, perimeter, and volume of geometric figures to compute another measure
- Use scale factors to determine the magnitude of a size change
- Compute the area of composite geometric figures when planning or visualization is required

Functions
- Express the sine, cosine, and tangent of an angle in a right triangle as a ratio of given side lengths
- Apply basic trigonometric ratios to solve right-triangle problems
- Use trigonometric concepts and basic identities to solve problems

ACT Standards for Algebra II

Probability, Statistics, & Data Analysis
- Exhibit knowledge of conditional and joint probability

Numbers: Concepts & Properties
- Exhibit some knowledge of the complex numbers
- Apply the rules of exponents and number properties—often in a new context—to solve problems that involve even/odd numbers, positive/negative integers, factors/multiples, and prime factorizations
- Multiply two complex numbers
- 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

Algebraic Expressions
- Manipulate expressions
- Write expressions for common algebra settings
- Write expressions that require planning and/or manipulating to accurately model a situation

Equations & Inequalities
- Solve absolute value and quadratic equations
- Write equations and inequalities that require planning, manipulating, and/or solving

Graphical Representations
- Recognize special characteristics of parabolas and circles (e.g., the vertex of a parabola and the center or radius of a circle)
- 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

Functions
- Work with function notation in evaluating simple quadratic functions at integer values
- Work with function notation in evaluating polynomial functions at integer values
- Evaluate composite functions at integer values
- Use trigonometric concepts and basic identities to solve problems