

ADP Benchmark Standards and Kentucky College Readiness Standards

The following mathematics standards are used as the basis for building the Kentucky Online Testing (KYOTE) college readiness and college algebra placement tests. They are a common subset of the American Diploma Project (ADP) benchmarks in mathematics <http://www.achieve.org/ADPBenchmarks> and the Kentucky College Readiness Standards <http://cpe.ky.gov/policies/academicpolicies/admissions.htm>.

Number Sense and Numerical Operations

N.1 Compute fluently and accurately with rational numbers without a calculator:

- N1.1.** Add, subtract, multiply and divide integers, fractions and decimals.
- N1.2.** Calculate and apply ratios, proportions, rates and percentages to solve problems.
- N1.3.** Use the correct order of operations to evaluate arithmetic expressions, including those containing parentheses.

N2. Recognize and apply magnitude (absolute value) and ordering of real numbers:

- N2.1.** Locate the position of a number on the number line, know that its distance from the origin is its absolute value, and know that the distance between two numbers on the number line is the absolute value of their difference.
- N2.2.** Determine the relative position on the number line of numbers and the relative magnitude of numbers expressed in fractional and decimal form.

Algebra

A1. Perform basic operations on algebraic expressions fluently and accurately:

- A1.1.** Understand the properties of integer exponents and roots, and apply these properties to simplify algebraic expressions.
- A1.3.** Add, subtract, and multiply polynomials.
- A1.4.** Factor polynomials by removing the greatest common factor; factor quadratic polynomials.
- A1.5.** Add, subtract, multiply, divide, and simplify rational expressions.
- A1.6.** Evaluate polynomial and rational expressions, and expressions containing radicals and absolute values, at specified values of their variables.

A2. Understand functions, their representations and their properties:

- A2.1.** Recognize whether a relationship given in symbolic or graphical form is a function.
- A2.2.** Understand functional notation and evaluate a function at a specified point in its domain.

A3. Apply basic algebraic operations to solve equations and inequalities:

- A3.1.** Solve linear equations and inequalities in one variable including those involving the absolute value of a linear function.
- A3.2.** Solve an equation involving several variables for one variable in terms of the others.
- A3.3.** Solve systems of two linear equations in two variables.
- A3.5** Solve quadratic equations in one variable.

A4. Graph a variety of equations and inequalities in two variables, demonstrate understanding of the relationships between the algebraic properties of an equation and the geometric properties of its graph, and interpret a graph:

- A4.1.** Graph a linear equation and demonstrate that it has a constant rate of change.
- A4.2.** Understand the relationship between the coefficients of a linear equation and the slope and x and y intercepts of its graph.
- A4.3.** Understand the relationship between a solution of a system of two linear equations in two variables and the graphs of the corresponding lines.
- A4.5** Graph a quadratic function and understand the relationship between its real zeros and the x-intercepts of its graph.

A5. Solve problems by converting the verbal information given into an appropriate mathematical model involving equations or systems of equations; apply appropriate mathematical techniques to analyze these mathematical models; and interpret the solution obtained in written form using appropriate units of measurement.

- A5.1.** Recognize and solve problems that can be modeled using a linear equation in one variable, such as time/rate/distance problems, percentage increase or decrease problems, and ratio and proportion problems.

A5.2. Recognize and solve problems that can be modeled using a system of two equations in two variables, such as mixture problems.

A5.3. Recognize and solve problems that can be modeled using a quadratic equation, such as the motion of an object under the force of gravity.

Geometry

G3. Know the basic theorems about similar triangles and use them to solve problems.

G5. Apply the Pythagorean theorem to solve problems.

G10. Represent geometric objects and figures algebraically using coordinates; use algebra to solve geometric problems.

G10.1. Use the coordinates of two points on a line to define its slope and use the slope to express the parallelism and perpendicularity of lines.

G10.2. Describe a line by a linear equation.

G10.3. Find the distance between two points using their coordinates and the Pythagorean theorem.