

Oklahoma School Testing Program: Grade 3 Mathematics

Performance Level Descriptors

Advanced

Students demonstrate superior performance on challenging subject matter.

In addition to demonstrating a broad and in-depth understanding and application of all skills at the **Proficient** level, students scoring at the **Advanced** level typically:

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| <ul style="list-style-type: none"> • Complete complex addition, subtraction, and multiplication problems and model division facts. • Order fractions using models and compose and decompose fractions related to the same whole. • Extend patterns and generate real-world situations to represent number sentences. | <ul style="list-style-type: none"> • Determine volume and elapsed time. • Summarize complex data sets and analyze the data to solve problems. • Solve complex and non-routine real-world problems, draw logical conclusions and justify solutions. |
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Proficient

Students demonstrate mastery over appropriate grade-level subject matter and readiness for the next grade level.

Students scoring at the **Proficient** level typically:

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| <ul style="list-style-type: none"> • Compare and order whole numbers. • Complete addition, subtraction, and multiplication problems and recognize the relationship between multiplication and division. • Construct and compare fractions using models. • Select the fewest number of coins for a given amount of money. • Determine rules to describe basic patterns. • Determine unknowns in equations and apply number properties. | <ul style="list-style-type: none"> • Classify angles. • Sort three-dimensional figures and determine the perimeter of polygons. • Determine the area of two-dimensional figures. • Read and analyze length, temperature, and time. Students summarize a data set and analyze the data to solve problems. • Solve real-world problems and employ problem-solving strategies of identifying and using appropriate information. |
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Oklahoma School Testing Program: Grade 3 Mathematics Performance Level Descriptors

Basic

Students demonstrate partial mastery of the essential knowledge and skills appropriate to their grade level.

Students scoring at the **Basic** level typically:

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| <ul style="list-style-type: none">• Represent whole numbers.• Complete simple addition, subtraction, and multiplication problems.• Read and write fractions.• Determine the value of a set of coins or bills. | <ul style="list-style-type: none">• Determine rules to describe simple patterns. Students determine unknowns in simple equations.• Identify right angles.• Choose an appropriate instrument to measure an object.• Read and write time from a digital clock. |
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Below Basic

Students have not performed at least at the **Basic** level.

Oklahoma School Testing Program: Grade 4 Mathematics

Performance Level Descriptors

Advanced

Students demonstrate superior performance on challenging subject matter.

In addition to demonstrating a broad and in-depth understanding and application of all skills at the **Proficient** level, students scoring at the **Advanced** level typically:

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| <ul style="list-style-type: none"> • Estimate and solve complex mathematical problems and determine the unknown in non-equivalent expressions. • Compare decimals and fractions. • Solve complex money problems. • Determine a rule and extend a complex pattern. • Determine and represent unknown values in complex problems. | <ul style="list-style-type: none"> • Determine volume. • Solve complex measurement problems. • Represent complex data sets and solve problems involving the data. • Solve complex and non-routine real-world problems, draw logical conclusions and justify solutions. |
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Proficient

Students demonstrate mastery over appropriate grade-level subject matter and readiness for the next grade level.

Students scoring at the **Proficient** level typically:

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| <ul style="list-style-type: none"> • Estimate and solve mathematical problems. • Use models to determine equivalent fractions, compare and order fractions, and add and subtract fractions. • Read and write decimals and make connections between decimals and fractions. • Determine change using coins. • Determine rules and extend patterns. • Determine unknown values in mathematical problems. | <ul style="list-style-type: none"> • Describe parts of geometrical figures and identify similarities in three-dimensional figures. • Decompose and determine the area of polygons. • Solve measurement problems. • Represent data sets and solve problems involving the data. • Solve real-world problems and employ problem-solving strategies of identifying and using appropriate information. |
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Oklahoma School Testing Program: Grade 4 Mathematics

Performance Level Descriptors

Basic

Students demonstrate partial mastery of the essential knowledge and skills appropriate to their grade level.

Students scoring at the **Basic** level typically:

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| <ul style="list-style-type: none">• Demonstrate the ability to estimate and solve simple mathematical problems.• Use models to determine simple equivalent fractions, compare and order whole numbers and simple fractions, and decompose fractions.• Read and write simple decimals and compare and order whole numbers and decimals. | <ul style="list-style-type: none">• Determine change using whole dollars.• Determine a rule and extend a simple pattern.• Determine unknown values in simple mathematical problems.• Identify quadrilaterals and determine the area of simple polygons.• Identify appropriate units and tools to measure. |
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Below Basic

Students have not performed at least at the **Basic** level.

Oklahoma School Testing Program: Grade 5 Mathematics

Performance Level Descriptors

Advanced

Students demonstrate superior performance on challenging subject matter.

In addition to demonstrating a broad and in-depth understanding and application of all skills at the **Proficient** level, students scoring at the **Advanced** level typically:

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| <ul style="list-style-type: none"> • Interpret the remainder of division problems within the context of the problem. • Order decimals, fractions, and whole numbers. • Evaluate complex expressions, equations, and inequalities. • Construct geometric figures and identify them in various contexts. | <ul style="list-style-type: none"> • Compare the volume, perimeter, or surface area of geometric figures. • Analyze complex graphs. • Solve complex and non-routine real-world problems, draw logical conclusions and justify solutions. |
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Proficient

Students demonstrate mastery over appropriate grade-level subject matter and readiness for the next grade level.

Students scoring at the **Proficient** level typically:

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| <ul style="list-style-type: none"> • Estimate and solve division problems with the remainder represented as a fraction or decimal. • Generate equivalent decimals and fractions, represent whole numbers or decimals, and compare fractions and decimals, including mixed numbers. • Estimate, add, and subtract decimals and fractions. • Describe patterns of change and graph these patterns as ordered pairs on a coordinate plane. • Evaluate expressions, equations, and inequalities. | <ul style="list-style-type: none"> • Solve volume and perimeter problems and simple surface area problems. • Determine reasonable values for the perimeter of shapes with curves. • Compare angles. • Recognize relationships within a measurement system. • Determine the mean, median, mode, and range of a data set and analyze simple graphs. • Solve real-world problems and employ problem-solving strategies of identifying and using appropriate information. |
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Oklahoma School Testing Program: Grade 5 Mathematics

Performance Level Descriptors

Basic

Students demonstrate partial mastery of the essential knowledge and skills appropriate to their grade level.

Students scoring at the **Basic** level typically:

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| <ul style="list-style-type: none">• Estimate and solve division problems with remainders and solve addition and subtraction real-world problems.• Recognize basic equivalent decimals and fractions, represent whole numbers, and compare and order fractions or decimals.• Add and subtract decimals and fractions with like denominators.• Describe simple patterns of change and identify ordered pairs on a coordinate plane. | <ul style="list-style-type: none">• Evaluate simple equivalent numerical expressions or equations.• Describe and classify geometric figures.• Solve simple volume and perimeter problems.• Choose an appropriate instrument to measure objects and read and analyze the length of objects.• Read and analyze the measure of angles.• Read simple graphs. |
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Below Basic

Students have not performed at least at the **Basic** level.

Oklahoma School Testing Program: Grade 6 Mathematics

Performance Level Descriptors

<p>Advanced</p> <p>Students demonstrate superior performance on challenging subject matter. In addition to demonstrating a broad and in-depth understanding and application of all skills at the Proficient level, students scoring at the Advanced level typically:</p>	
<ul style="list-style-type: none"> • Estimate and solve complex problems requiring unit conversions. • Use the distance between points and transformations to solve complex problems involving congruent figures. 	<ul style="list-style-type: none"> • Analyze the differences between two outcomes of simple experiments. • Solve complex and non-routine real-world problems, draw logical conclusions and justify solutions.
<p>Proficient</p> <p>Students demonstrate mastery over appropriate grade-level subject matter and readiness for the next grade level. Students scoring at the Proficient level typically:</p>	
<ul style="list-style-type: none"> • Estimate, illustrate, and simplify the addition and subtraction of integers and assess the reasonableness of an answer. • Solve ratio and unit rate problems. • Estimate and illustrate the multiplication and division of non-negative rational numbers. • Evaluate the validity of the value of a variable. • Generate expressions, equations, and inequalities. • Interpret the solution of an equation and assess the reasonableness of the solution. • Determine the area of polygons and composite figures. • Use relationships between angles and the triangle sum theorem to solve problems. 	<ul style="list-style-type: none"> • Estimate and solve problems requiring unit conversion. • Predict transformations, analyze lines of symmetry, and use the distance between points and transformations to solve problems involving congruent figures. • Explain and justify which measure of central tendency provides the most descriptive information for a data set. • Create and analyze box-and-whisker plots and explain and compare possible outcomes of simple experiments. • Solve real-world problems and employ problem-solving strategies of identifying and using appropriate information.

Oklahoma School Testing Program: Grade 6 Mathematics

Performance Level Descriptors

Basic

Students demonstrate partial mastery of the essential knowledge and skills appropriate to their grade level.

Students scoring at the **Basic** level typically:

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| <ul style="list-style-type: none">• Read, order, represent, and explain rational numbers expressed as fractions, decimals, percents, and ratios.• Write positive integers as products of factors.• Illustrate or simplify the addition and subtraction of integers.• Identify and compare quantities, determine unit rates, and find equivalent fractions and percents.• Multiply and divide non-negative rational numbers. Students graph ordered pairs in all quadrants.• Represent reflective relationships between varying quantities. | <ul style="list-style-type: none">• Evaluate the value of a variable in expressions, equations, and inequalities.• Use number sense and properties of operations to solve equations and graph the solution.• Determine the area of parallelograms and triangles.• Identify angle relationships by name.• Identify and display the effect of transformations.• Identify lines of symmetry.• Calculate measures of central tendency, determine the sample space of simple experiments, and identify possible outcomes. |
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Below Basic

Students have not performed at least at the **Basic** level.

Oklahoma School Testing Program: Grade 7 Mathematics

Performance Level Descriptors

Advanced

Students demonstrate superior performance on challenging subject matter.

In addition to demonstrating a broad and in-depth understanding and application of all skills at the **Proficient** level, students scoring at the **Advanced** level typically:

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| <ul style="list-style-type: none"> • Interpret equations and inequalities involving variables and rational numbers. • Make connections between circumference and area to solve problems involving circles. • Analyze, apply, and display the effect of dilations and multiple transformations. | <ul style="list-style-type: none"> • Use central tendencies and range, predict data and select an appropriate data display, and predict theoretical probability. • Solve complex and non-routine real-world problems, draw logical conclusions and justify solutions. |
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Proficient

Students demonstrate mastery over appropriate grade-level subject matter and readiness for the next grade level.

Students scoring at the **Proficient** level typically:

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| <ul style="list-style-type: none"> • Estimate solutions of problems involving rational numbers and assess the reasonableness of the solutions. • Differentiate between proportional and inversely proportional relationships and identify the constant of proportionality. • Represent proportional relationships in a variety of ways. • Use representations to identify and compare unit rates. • Solve problems involving proportional relationships and assess the reasonableness of solutions. | <ul style="list-style-type: none"> • Represent, solve, and write equations. • Solve simple inequalities. • Generate and evaluate equivalent expressions with justification of steps. • Interpret theoretical probability and draw conclusions. Students apply the effect of dilations and transformations. • Solve real-world problems and employ problem-solving strategies of identifying and using appropriate information. |
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Oklahoma School Testing Program: Grade 7 Mathematics

Performance Level Descriptors

Basic

Students demonstrate partial mastery of the essential knowledge and skills appropriate to their grade level.

Students scoring at the **Basic** level typically:

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| <ul style="list-style-type: none">• Recognize, compare, and order rational numbers.• Create equivalent representations of rational numbers.• Calculate and model mathematical problems involving rational numbers and exponents.• Calculate the absolute value of a rational number.• Describe and identify a proportional relationship.• Identify and solve problems involving ratios and unit rates.• Represent, solve, and write simple equations.• Represent, write, and graph simple inequalities. | <ul style="list-style-type: none">• Evaluate expressions using the order of operations.• Determine the surface area and volume of rectangular prisms and calculate the area and perimeter of trapezoids.• Calculate the circumference and area of circles.• Describe the effect of dilations and transformations.• Calculate the measures of central tendencies and range and determine appropriate data displays.• Calculate theoretical probability. |
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Below Basic

Students have not performed at least at the **Basic** level.

Oklahoma School Testing Program: Grade 8 Mathematics

Performance Level Descriptors

<p>Advanced</p> <p>Students demonstrate superior performance on challenging subject matter. In addition to demonstrating a broad and in-depth understanding and application of all skills at the Proficient level, students scoring at the Advanced level typically:</p>	
<ul style="list-style-type: none"> • Generate, simplify, and evaluate complex equivalent expressions. • Make connections between volume and surface area to solve problems involving solids. • Compare the volume and surface area of different solids. 	<ul style="list-style-type: none"> • Describe the impact on central tendencies of a data set with multiple outliers and when inserting or deleting multiple data points. • Solve complex and non-routine real-world problems, draw logical conclusions and justify solutions.
<p>Proficient</p> <p>Students demonstrate mastery over appropriate grade-level subject matter and readiness for the next grade level. Students scoring at the Proficient level typically:</p>	
<ul style="list-style-type: none"> • Solve complex and non-routine real-world problems, draw logical conclusions and justify solutions. • Generate, simplify, and evaluate equivalent expressions. • Classify and explain operational closure of rational and irrational numbers. • Distinguish between a linear and nonlinear function. • Identify independent and dependent variables. • Describe, analyze, and represent linear functions with two variables and translate between representations. 	<ul style="list-style-type: none"> • Use and apply the Pythagorean Theorem. • Describe the impact on central tendencies of a data set with an outlier and when inserting or deleting a data point. • Interpret a scatterplot, determine the rate of change, and use a line of best fit to make predictions. • Calculate, interpret, and predict experimental probability and generalize samples to populations. • Solve real-world problems and employ problem-solving strategies of identifying and using appropriate information.

Oklahoma School Testing Program: Grade 8 Mathematics

Performance Level Descriptors

Basic

Students demonstrate partial mastery of the essential knowledge and skills appropriate to their grade level.

Students scoring at the **Basic** level typically:

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| <ul style="list-style-type: none">• Simplify and generate simple equivalent expressions, including expressions in scientific notation.• Translate between standard form and scientific notation.• Identify and compare real numbers.• Recognize if a graph represents a linear function.• Identify intercepts and slope from the graph of a line.• Identify the effect on the graph of a linear function when characteristics are changed.• Solve and graph equations and inequalities. | <ul style="list-style-type: none">• Use the Pythagorean Theorem to identify right triangles and to find the length of the hypotenuse.• Calculate the surface area and volume of solids.• Identify the outliers of a data set.• Identify the line of best fit from a given scatterplot and determine if the rate of change is positive or negative.• Calculate the experimental probability of single events, identify sample spaces, and classify events as independent or dependent. |
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Below Basic

Students have not performed at least at the **Basic** level.

College- and Career-Readiness Assessment: Mathematics Performance Level Descriptors

Advanced

Students at the Advanced level have a 90% probability of earning a C or higher and a 66% probability of earning a B or higher in credit-bearing math courses at 4-year institutions. Their average first year college GPA at this level is a 3.3 or above (low B or higher). Students at this level are highly likely to be on track to be successful at the next level.

Students demonstrate superior performance with challenging subject matter and clearly exhibit readiness for college and career. In addition to demonstrating broad and in-depth understanding and application of all skills in the Proficient Level, students scoring at the Advanced Level typically:

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| <ul style="list-style-type: none">• Rewrite rational, radical, and exponential expressions.• Find the value of i^n for any whole number n.• Perform operations on complex numbers.• Add, subtract, and perform scalar multiplication on matrices.• Interpret a term in a linear function of a challenging context.• Make connections between different representations of, linear functions, systems of two linear equations, and systems of two linear inequalities in two variables.• Determine the conditions under which a system of two linear equations in two has no solution, one solution, or infinitely many solutions.• Create and use a linear equation in two variables that represents a challenging context.• Create and solve a 3-variable linear system.• Create and use an inequality in one or two variables that represents a challenging context.• Make connections between the graph and solution to a quadratic and linear system of equations.• Given a graph of a quadratic or exponential function representing a context, interpret a value, variable, point, or input-output pair in terms of the context. | <ul style="list-style-type: none">• Solve absolute value, logarithmic, polynomial, rational, radical, and exponential equations in real-world and mathematical problems.• Solve quadratic equations with complex solutions.• Analyze graphs relationships between two quantities, including relationships that are not represented by a linear, quadratic, or exponential equation.• Identify characteristics of graphs of functions.• Identify the effect of multiple transformations of functions.• Find inverse functions.• Divide polynomials.• Solve challenging radical and rational equations.• Solve problems involving arithmetic and geometric sequences and series.• Identify an appropriate inference or conclusion based on information from a graph, table, or scatterplot.• Identify the equation of a line or curve that best fits the data in a scatterplot.• Identify the appropriate conclusion to draw from a description of a study's design and the study results.• Compare measures of center and spread of two data distributions represented visually. |
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College- and Career-Readiness Assessment: Mathematics Performance Level Descriptors

Advanced (cont.)

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| <ul style="list-style-type: none">• Find the probability of a compound event.• Recognize the effect of standard deviation.• Count using the Fundamental Counting Principle, combinations, and permutations, including when cases overlap.• Identify the most appropriate sample or sampling method to best answer the question of interest.• Identify the population to which the results of a survey can be generalized.• Understand sampling variability when the population proportion is estimated using sample data.• Use similarity as well as theorems related to lines, angles, and triangles to solve problems.• Find the diameter, radius, center, or points on a circle in coordinate plane. | <ul style="list-style-type: none">• Solve problems using properties of special right triangles, the Pythagorean Theorem or its converse, and trigonometric ratios.• Solve problems using properties and theorems relating to circles and parts of circles, such as radii, diameters, tangents, angles, arcs, arc length, and sector area.• Apply the triangle inequality theorem.• Recognize congruencies that appear through the use of auxiliary lines.• Determine an expression for the area of a regular polygon in terms of side length or apothem/altitude.• Find area and volume of composite shapes.• Convert area and volume to different units. |
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College- and Career-Readiness Assessment: Mathematics Performance Level Descriptors

Proficient

Students at the Proficient level have approximately a 75% or higher probability of earning a C or higher in credit-bearing math courses at all levels of higher education. Their average first year college GPA at this level is between a 2.9 and 3.3 (high C to low B). Students at this level are likely to be on track to be successful at the next level.

Students demonstrate mastery with subject matter and exhibit readiness for college and career. In addition to demonstrating understanding and application of all skills in the Basic Level, students scoring at the Proficient Level typically:

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| <ul style="list-style-type: none">• Rationalize numeric expressions.• Convert numbers with rational exponents to radical form.• Simplify cube roots.• Use properties of radicals and exponents to rewrite expressions.• Evaluate slope in given contexts.• Interpret terms in linear functions and make connections between different representations.• Determine the number of solutions linear systems of two equations have.• Create and solve linear equations within context.• Create and use inequalities within context.• Graph compound linear inequalities.• Interpret the constant, variable, term, solution, or input-output pair in quadratic or exponential functions in context.• Add, subtract, and multiply polynomials.• Solve multistep quadratic equations.• Solve radical equations.• Solve rational equations.• Solve systems of equations with one linear and one quadratic equation.• Solve literal equations for a given variable.• Use Venn diagrams to make conclusions. | <ul style="list-style-type: none">• Make connections between the various representations of quadratic or exponential functions.• Factor polynomial expressions.• Determine the number of solutions quadratic equations have.• Create and/or use quadratic or exponential functions to represent real-world contexts.• Graph polynomial functions.• Evaluate the effects of single function transformations.• Evaluate logarithmic, polynomial, rational, radical, and exponential functions, including where they are undefined.• Find near terms in geometric sequences.• Compose 2 functions.• Evaluate conclusions of population proportions based on sample data and margins of error.• Identify bias in sampling methods.• Interpret scatterplots and use lines of best fit to make predictions.• Calculate, compare, and interpret measures of central tendency in context.• Determine probabilities of compound events.• Find probabilities where the sample space must be determined from the context.• Solve problems using properties of right triangles. |
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College- and Career-Readiness Assessment: Mathematics Performance Level Descriptors

Proficient (cont.)

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| <ul style="list-style-type: none">• Make connections between the equation of a circle in a coordinate plane and the center and radius of the circle.• Solve simple problems using properties and theorems relating to circles and parts of circles.• Solve problems using properties of similar triangles.• Find the measure of interior angles of polygons.• Solve problems using the midpoint formula.• Solve problems using multiple theorems related to lines, angles, or triangles. | <ul style="list-style-type: none">• Solve problems involving circumference, area, surface area, perimeter and volume.• Solve problems involving translations, rotations, and reflections.• Solve problems using the Pythagorean Theorem.• Solve problems using the distance formula.• Solve problems involving right triangles using trigonometric functions. |
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College- and Career-Readiness Assessment: Mathematics Performance Level Descriptors

Basic

Students at this level have a 50% or higher probability of earning a C or higher in credit-bearing math courses across all levels of higher education. Their average first year college GPA at this level is between a 2.4 to 2.8 (mid to high C student). Students at this level likely require additional coursework and/or support to be on track for college and/or career success.

Students demonstrate partial mastery with subject matter but may not exhibit readiness for college and career. In addition to demonstrating understanding and application of all skills in the Below Basic Level, students scoring at the Basic Level typically:

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| <ul style="list-style-type: none">• Add complex numbers and add matrices.• Simplify square roots.• Rewrite monomials with integer exponents to have positive exponents.• Create linear expressions, equations or inequalities to model contexts.• Create systems of two linear equations to model contexts.• Solve systems of two linear equations with integer coefficients.• Make connections between different representations of linear relationships between two variables.• Create and use linear relationships to solve a problem.• Multiply polynomials by monomials.• Multiply binomials.• Factor monomials from polynomial expressions.• Factor trinomials.• Add and subtract polynomials.• Solve quadratic equations in the form $ax^2 = b$.• Solve simple radical equations.• Use function notation to represent functions.• Evaluate absolute value functions. | <ul style="list-style-type: none">• Evaluate simple algebraic expressions.• Identify the shape of graphs from some of their points.• Identify graphs of nonlinear relationships between two variables based on descriptions of characteristics.• Read and interpret information presented in graphs, scatterplots, or tables.• Find the median or mean of data sets.• Find probabilities of simple events.• Estimate expected population counts or proportions from sample counts or proportions.• Find probabilities of simple compound events.• Calculate simple conditional probabilities.• Solve simple problems about geometric figures using the vertical angle theorem, the triangle angle sum theorem, or theorems about a transversal crossing parallel lines.• Solve real-world problems using the Pythagorean Theorem.• Solve simple problems involving perimeter, area and volume.• Identify corresponding parts of congruent triangles.• Translate points horizontally and vertically on a coordinate plane. |
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Below Basic

Students have not performed at least at the **Basic** level.