

## Alignments of PSAT/NMSQT Skill Categories and State Standards

PSAT/NMSQT Skill Category and Description of Skills	Hawaii Math: Content Standards 2005		
	Course/ Level	Standard	Standard ID
<b>Algebra and Functions</b> Solve problems using algebraic expressions and symbols to represent relationships, patterns and functions of different types.	Algebra	MA.AI.10.1 Solve linear equations and inequalities in one variable using a variety of strategies (e.g., algebraically, by graphing, by using a graphing calculator)	MA.AI.10.1
	Algebra	MA.AI.10.2 Translate between verbal mathematical situations and algebraic expressions and equations	MA.AI.10.2
	Algebra	MA.AI.10.3 Justify the steps used in simplifying expressions and solving equations and inequalities	MA.AI.10.3
	Algebra	MA.AI.10.4 Determine the equation of a line when given the graph of the line, the slope and a point on the line, or two points on the line	MA.AI.10.4
	Algebra	MA.AI.10.5 Solve systems of two linear equations in two variables algebraically and graphically	MA.AI.10.5
	Algebra	MA.AI.10.6 Factor first- and second-degree binomials and trinomials in one or two variables	MA.AI.10.6
	Algebra	MA.AI.10.7 Solve quadratic equations in one variable algebraically, graphically, or by using graphing technology	MA.AI.10.7
	Algebra	MA.AI.10.8 Select and use a variety of strategies (e.g., concrete objects, pictorial representations, algebraic manipulation) to perform operations on polynomials	MA.AI.10.8
	Algebra	MA.AI.10.9 Analyze transformations of lines and understand how the transformation are represented in equations	MA.AI.10.9
	Algebra	MA.AI.3.2 Apply the laws of exponents to perform operations on expressions with integral exponents	MA.AI.3.2
	Algebra	MA.AI.9.1 Determine if a linear pattern exists in a set of data and represent the data algebraically and graphically	MA.AI.9.1
	Algebra	MA.AI.9.2 Compare and contrast the concepts of direct and inverse variation of a relation	MA.AI.9.2
	Algebra	MA.AI.9.3 Determine the zeros of a linear or quadratic function algebraically and graphically	MA.AI.9.3
	Algebra	MA.AI.9.4 Compare and contrast the properties of linear functions and exponential functions	MA.AI.9.4
	Algebra II	MA.AII.10.1 Solve equations and inequalities involving absolute values	MA.AII.10.1

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<b>Algebra and Functions</b> Solve problems using algebraic expressions and symbols to represent relationships, patterns and functions of different types.	Algebra II	MA.AII.10.10 Analyze translations and dilations for graphs of absolute value functions, parabolas, and circles, and understand how the transformations are represented in equations	MA.AII.10.10
	Algebra II	MA.AII.10.2 Solve systems of linear equations and inequalities in two or three variables using a variety of strategies (e.g., substitution, graphing, matrices, technology)	MA.AII.10.2
	Algebra II	MA.AII.10.3 Solve equations containing radical and exponents	MA.AII.10.3
	Algebra II	MA.AII.10.4 Factor polynomials representing perfect squares, the difference in squares, perfect square trinomials, the sum and difference of cubes, and general trinomials	MA.AII.10.4
	Algebra II	MA.AII.10.5 Apply quadratic equations to real-world situations	MA.AII.10.5
	Algebra II	MA.AII.10.8 Add, subtract, multiply, divide, and simplify rational expressions, radical expressions containing positive rational numbers, and expressions containing rational exponents	MA.AII.10.8
	Algebra II	MA.AII.10.9 Translate between the equations of conic sections (e.g., circle, ellipse, parabola, hyperbola) and their graphs	MA.AII.10.9
	Algebra II	MA.AII.9.1 Apply the properties of arithmetic and geometric sequences and series to solve problems	MA.AII.9.1
	Algebra II	MA.AII.9.2 Use exponential functions to solve problems involving exponential growth and decay	MA.AII.9.2
	Algebra II	MA.AII.9.3 Use the properties of many types of functions (e.g., polynomial, step, absolute value, step, exponential, and logarithmic) to identify the function's graph	MA.AII.9.3
	Algebra II	MA.AII.9.4 Use the appropriate terminology and notation to define functions and their properties (e.g., domain, range, function composition, inverses, zeros)	MA.AII.9.4
	Algebra II	MA.AII.9.5 Determine the zeros of a function algebraically or graphically	MA.AII.9.5
	Algebra II	MA.AII.9.6 Describe the relationship among relations and functions	MA.AII.9.6
Algebra II	MA.AII.9.7 Determine the domain and range of a relation given a graph or a set of points	MA.AII.9.7	
Analytical Geometry	MA.AG.10.3 Use the concept of the distance from a point to a plane, distance between points, and the angle between two planes in three-dimensions to solve problems	MA.AG.10.3	

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<b>Algebra and Functions</b> Solve problems using algebraic expressions and symbols to represent relationships, patterns and functions of different types.	Analytical Geometry	MA.AG.10.5 Convert between parametric equations and their graphs	MA.AG.10.5
	Analytical Geometry	MA.AG.10.6 Determine the intersection of curves algebraically and graphically, including using graphing technology when available	MA.AG.10.6
	Analytical Geometry	MA.AG.9.1 Use the relationship among the properties of conic sections (e.g., asymptotes, center of a conic, directrix, eccentricity, focus, major and minor axis, vertex) and graph conic sections using the standard form of the equations	MA.AG.9.1
	Analytical Geometry	MA.AG.9.2 Use properties (e.g., domain, range, intercepts, symmetry, asymptotes) to graph polynomial, rational, and radical equations in two variables	MA.AG.9.2
	Analytical Geometry	MA.AG.9.4 Use addition of ordinates to graph sums and differences of functions	MA.AG.9.4
<b>Communication</b> Express mathematical ideas precisely and communicate them coherently and clearly in the language and notation of mathematics.	Algebra II	MA.AII.9.3 Use the properties of many types of functions (e.g., polynomial, step, absolute value, step, exponential, and logarithmic) to identify the function's graph	MA.AII.9.3
	Algebra II	MA.AII.9.4 Use the appropriate terminology and notation to define functions and their properties (e.g., domain, range, function composition, inverses, zeros)	MA.AII.9.4
	Algebra II	MA.AII.9.6 Describe the relationship among relations and functions	MA.AII.9.6
	Analytical Geometry	MA.AG.7.1 Recognize conic sections and describe their characteristics	MA.AG.7.1
	Geometry	MA.G.5.3 Explain properties and characteristics of angle bisectors, perpendicular bisectors, and parallel lines	MA.G.5.3
	Geometry	MA.G.5.4 Use the relationship between pairs of angles (e.g., complementary, supplementary, vertical, exterior, interior) to determine unknown angle measures or definitions of properties	MA.G.5.4
	Geometry	MA.G.6.1 Describe three-dimensional figures that are formed by translating two-dimensional figures	MA.G.6.1
	Geometry	MA.G.8.2 Describe the concept of rigid motion on figures in the coordinate plane, including rotation, translation, and reflection	MA.G.8.2

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<b>Communication</b> Express mathematical ideas precisely and communicate them coherently and clearly in the language and notation of mathematics.	Probability	MA.P.14.1 Describe the relationship among events (e.g., inclusive, disjoint, complementary, independent, dependent)	MA.P.14.1
	Probability	MA.P.14.3 Differentiate between theoretical and experimental probability	MA.P.14.3
	Probability	MA.P.14.4 Explain the difference between probability and odds and convert from one to the other	MA.P.14.4
	Statistics	MA.S.11.2 Recognize the variables and controls in an experiment or investigation	MA.S.11.2
	Statistics	MA.S.11.5 Recognize sampling, randomness, bias, and sampling size in data collection and interpretation	MA.S.11.5
	Statistics	MA.S.11.6 Describe the purpose and function of a variety of data collection methods (e.g., census, sample surveys, experiment, observation)	MA.S.11.6
	Statistics	MA.S.12.3 Describe the effect of sample size and transformation on the shape, center, and spread of data	MA.S.12.3
<b>Connections</b> Connect ideas from different areas of mathematics (particularly geometry and algebra) to state or solve abstract or applied problems.	Algebra	MA.AI.10.5 Solve systems of two linear equations in two variables algebraically and graphically	MA.AI.10.5
	Algebra	MA.AI.10.7 Solve quadratic equations in one variable algebraically, graphically, or by using graphing technology	MA.AI.10.7
	Algebra	MA.AI.9.1 Determine if a linear pattern exists in a set of data and represent the data algebraically and graphically	MA.AI.9.1
	Algebra	MA.AI.9.3 Determine the zeros of a linear or quadratic function algebraically and graphically	MA.AI.9.3
	Algebra II	MA.AII.10.5 Apply quadratic equations to real-world situations	MA.AII.10.5
	Algebra II	MA.AII.9.5 Determine the zeros of a function algebraically or graphically	MA.AII.9.5
	Analytical Geometry	MA.AG.10.5 Convert between parametric equations and their graphs	MA.AG.10.5
	Analytical Geometry	MA.AG.10.6 Determine the intersection of curves algebraically and graphically, including using graphing technology when available	MA.AG.10.6

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<b>Connections</b> Connect ideas from different areas of mathematics (particularly geometry and algebra) to state or solve abstract or applied problems.	Analytical Geometry	MA.AG.8.2 Use the relationship between the slope of a line and the angle of inclination to solve problems	MA.AG.8.2
	Geometry	MA.G.5.5 Apply the concepts of special right triangles to real-world situations	MA.G.5.5
	Statistics	MA.S.13.1 Recognize that some data can be represented algebraically (e.g., linear, quadratic, exponential, sinusoidal)	MA.S.13.1
<b>Data, Statistics, and Probability</b> Analyze data, understand descriptive statistics, make inferences and determine the likelihood that certain events will occur.	Algebra	MA.AI.12.1 Compare data sets using statistical techniques (e.g., measures of central tendency, standard deviation, range, stem-and-leaf plots, and box-and-whisker graphs)	MA.AI.12.1
	Algebra	MA.AI.12.2 Display bivariate data in a scatter plot, describe its shape, and determine the line of best fit that models a trend (if a trend exists)	MA.AI.12.2
	Algebra II	MA.AII.12.1 Identify trends in bivariate data and find functions that model the data	MA.AII.12.1
	Algebra II	MA.AII.14.1 Use the fundamental counting principles for combinations and permutations to determine probability	MA.AII.14.1
	Algebra II	MA.AII.14.2 Calculate probabilities of events under different relationships (e.g., inclusion, disjoint, complementary, independent, dependent, with replacement, without replacement)	MA.AII.14.2
	Probability	MA.P.14.1 Describe the relationship among events (e.g., inclusive, disjoint, complementary, independent, dependent)	MA.P.14.1
	Probability	MA.P.14.2 Calculate the probability of two events under union and intersection	MA.P.14.2
	Probability	MA.P.14.3 Differentiate between theoretical and experimental probability	MA.P.14.3
	Probability	MA.P.14.4 Explain the difference between probability and odds and convert from one to the other	MA.P.14.4
	Probability	MA.P.14.5 Calculate the probability of an outcome for an experiment with and without replacement	MA.P.14.5
Probability	MA.P.14.6 Apply discrete random variables to solve for the probability of experimental outcomes	MA.P.14.6	
Probability	MA.P.14.7 Estimate and calculate expected values	MA.P.14.7	

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<b>Data, Statistics, and Probability</b>  Analyze data, understand descriptive statistics, make inferences and determine the likelihood that certain events will occur.	Statistics	MA.S.11.1 Develop a hypothesis for an investigation or experiment	MA.S.11.1
	Statistics	MA.S.11.2 Recognize the variables and controls in an experiment or investigation	MA.S.11.2
	Statistics	MA.S.11.3 Select appropriate display for a data set (e.g., frequency table, histogram, line graph, bar graph, stem-and-leaf plot, box-and-whisker plot, scatter plot)	MA.S.11.3
	Statistics	MA.S.11.4 Recognize features of representations of data that can produce misleading interpretations	MA.S.11.4
	Statistics	MA.S.11.5 Recognize sampling, randomness, bias, and sampling size in data collection and interpretation	MA.S.11.5
	Statistics	MA.S.11.6 Describe the purpose and function of a variety of data collection methods (e.g., census, sample surveys, experiment, observation)	MA.S.11.6
	Statistics	MA.S.12.1 Use measures of central tendency and spread to interpret data	MA.S.12.1
	Statistics	MA.S.12.3 Describe the effect of sample size and transformation on the shape, center, and spread of data	MA.S.12.3
	Statistics	MA.S.12.4 Use the line or curve of best fit to interpret data	MA.S.12.4
	Statistics	MA.S.13.1 Recognize that some data can be represented algebraically (e.g., linear, quadratic, exponential, sinusoidal)	MA.S.13.1
Statistics	MA.S.13.2 Use interpolation and extrapolation to make predictions and inferences about data	MA.S.13.2	
<b>Geometry and Measurement</b>  Solve problems based on understanding the properties of shapes, such as triangles and circles, and the spatial relationships between angles and lines.	Algebra	MA.AI.4.1 Use formulas, functions, or conversion equations to solve problems dealing with determining a measurement based on another derived or given measurement	MA.AI.4.1
	Algebra	MA.AI.8.1 Graph linear equations using slope-intercept, point-slope, and x- and y-intercept techniques	MA.AI.8.1
	Algebra	MA.AI.8.2 Determine the slope of a line when given the graph of a line, two points on the line, or the equation of the line	MA.AI.8.2

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<b>Geometry and Measurement</b> Solve problems based on understanding the properties of shapes, such as triangles and circles, and the spatial relationships between angles and lines.	Algebra II	MA.AII.4.1 Use advanced formulas or functions to solve problems dealing with determining a measurement based on another derived or given measure	MA.AII.4.1
	Analytical Geometry	MA.AG.7.1 Recognize conic sections and describe their characteristics	MA.AG.7.1
	Analytical Geometry	MA.AG.8.1 Use formulas involving division of a line segment and angles between two lines	MA.AG.8.1
	Analytical Geometry	MA.AG.8.2 Use the relationship between the slope of a line and the angle of inclination to solve problems	MA.AG.8.2
	Geometry	MA.G.4.2 Solve problems using the formulas for perimeter, circumference, area, and volume of two- and three- dimensional figures and solids	MA.G.4.2
	Geometry	MA.G.4.3 Determine the effect of dimension changes to perimeter, area, and volume for common geometric figures and solids	MA.G.4.3
	Geometry	MA.G.5.1 Use inductive and deductive reasoning to create and defend geometric conjectures	MA.G.5.1
	Geometry	MA.G.5.2 Use the concept of corresponding parts to prove that triangles, and other polygons, are congruent or similar	MA.G.5.2
	Geometry	MA.G.5.3 Explain properties and characteristics of angle bisectors, perpendicular bisectors, and parallel lines	MA.G.5.3
	Geometry	MA.G.5.4 Use the relationship between pairs of angles (e.g., complementary, supplementary, vertical, exterior, interior) to determine unknown angle measures or definitions of properties	MA.G.5.4
	Geometry	MA.G.5.5 Apply the concepts of special right triangles to real-world situations	MA.G.5.5
	Geometry	MA.G.5.6 Use the relationships among properties of circles (e.g., chords, secants, tangents, arcs, circumference, radius, diameter, inscribed polygons) to solve problems	MA.G.5.6
Geometry	MA.G.6.1 Describe three-dimensional figures that are formed by translating two-dimensional figures	MA.G.6.1	
Geometry	MA.G.7.1 Draw cross-sections, truncations, and compositions/decompositions of three-dimensional objects	MA.G.7.1	

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	Course/ Level	Standard	Standard ID
<b>Geometry and Measurement</b> Solve problems based on understanding the properties of shapes, such as triangles and circles, and the spatial relationships between angles and lines.	Geometry	MA.G.7.2 Use concrete objects, pictorial representations, computer software, or graphing calculators to solve geometric problems	MA.G.7.2
	Geometry	MA.G.8.1 Use coordinate geometry to produce formulas and prove theorems for the midpoint of a line segment, the distance formula, and forms of equations of lines and circles	MA.G.8.1
	Geometry	MA.G.8.2 Describe the concept of rigid motion on figures in the coordinate plane, including rotation, translation, and reflection	MA.G.8.2
<b>Number and Operations</b> Understand types of numbers (integers, fractions, decimals), their properties and the correct order of operations (addition, multiplication, division). Perform computations correctly.	Algebra	MA.AI.3.1 Apply arithmetic properties to operate on and simplify expressions that include radicals and other real numbers	MA.AI.3.1
<b>Problem Solving</b> Solve abstract and practical problems, applying and adapting a variety of strategies. Monitor progress and evaluate answers in terms of questions asked.	Algebra	MA.AI.10.1 Solve linear equations and inequalities in one variable using a variety of strategies (e.g., algebraically, by graphing, by using a graphing calculator)	MA.AI.10.1
	Algebra	MA.AI.10.6 Factor first- and second-degree binomials and trinomials in one or two variables	MA.AI.10.6
	Algebra	MA.AI.10.8 Select and use a variety of strategies (e.g., concrete objects, pictorial representations, algebraic manipulation) to perform operations on polynomials	MA.AI.10.8
	Algebra	MA.AI.3.2 Apply the laws of exponents to perform operations on expressions with integral exponents	MA.AI.3.2
	Algebra	MA.AI.4.1 Use formulas, functions, or conversion equations to solve problems dealing with determining a measurement based on another derived or given measurement	MA.AI.4.1
	Algebra	MA.AI.8.2 Determine the slope of a line when given the graph of a line, two points on the line, or the equation of the line	MA.AI.8.2
	Algebra II	MA.AII.10.1 Solve equations and inequalities involving absolute values	MA.AII.10.1
	Algebra II	MA.AII.10.2 Solve systems of linear equations and inequalities in two or three variables using a variety of strategies (e.g., substitution, graphing, matrices, technology)	MA.AII.10.2
	Algebra II	MA.AII.10.3 Solve equations containing radical and exponents	MA.AII.10.3

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	Course/ Level	Standard	Standard ID
<b>Problem Solving</b> Solve abstract and practical problems, applying and adapting a variety of strategies. Monitor progress and evaluate answers in terms of questions asked.	Algebra II	MA.AII.10.4 Factor polynomials representing perfect squares, the difference in squares, perfect square trinomials, the sum and difference of cubes, and general trinomials	MA.AII.10.4
	Algebra II	MA.AII.14.1 Use the fundamental counting principles for combinations and permutations to determine probability	MA.AII.14.1
	Algebra II	MA.AII.14.2 Calculate probabilities of events under different relationships (e.g., inclusion, disjoint, complementary, independent, dependent, with replacement, without replacement)	MA.AII.14.2
	Algebra II	MA.AII.4.1 Use advanced formulas or functions to solve problems dealing with determining a measurement based on another derived or given measure	MA.AII.4.1
	Algebra II	MA.AII.9.1 Apply the properties of arithmetic and geometric sequences and series to solve problems	MA.AII.9.1
	Algebra II	MA.AII.9.2 Use exponential functions to solve problems involving exponential growth and decay	MA.AII.9.2
	Algebra II	MA.AII.9.7 Determine the domain and range of a relation given a graph or a set of points	MA.AII.9.7
	Analytical Geometry	MA.AG.10.3 Use the concept of the distance from a point to a plane, distance between points, and the angle between two planes in three-dimensions to solve problems	MA.AG.10.3
	Analytical Geometry	MA.AG.8.1 Use formulas involving division of a line segment and angles between two lines	MA.AG.8.1
	Analytical Geometry	MA.AG.9.2 Use properties (e.g., domain, range, intercepts, symmetry, asymptotes) to graph polynomial, rational, and radical equations in two variables	MA.AG.9.2
	Analytical Geometry	MA.AG.9.4 Use addition of ordinates to graph sums and differences of functions	MA.AG.9.4
	Geometry	MA.G.4.2 Solve problems using the formulas for perimeter, circumference, area, and volume of two- and three- dimensional figures and solids	MA.G.4.2
	Geometry	MA.G.5.6 Use the relationships among properties of circles (e.g., chords, secants, tangents, arcs, circumference, radius, diameter, inscribed polygons) to solve problems	MA.G.5.6
	Geometry	MA.G.7.2 Use concrete objects, pictorial representations, computer software, or graphing calculators to solve geometric problems	MA.G.7.2

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<b>Problem Solving</b> Solve abstract and practical problems, applying and adapting a variety of strategies. Monitor progress and evaluate answers in terms of questions asked.	Probability	MA.P.14.2 Calculate the probability of two events under union and intersection	MA.P.14.2
	Probability	MA.P.14.5 Calculate the probability of an outcome for an experiment with and without replacement	MA.P.14.5
	Probability	MA.P.14.6 Apply discrete random variables to solve for the probability of experimental outcomes	MA.P.14.6
	Probability	MA.P.14.7 Estimate and calculate expected values	MA.P.14.7
	Probability	MA.P.14.8 Apply permutations, combinations, and the fundamental counting principle to calculate the probability of two events	MA.P.14.8
<b>Reasoning</b> Develop and use mathematical arguments and proofs to explore the truth of conjectures and justify conclusions.	Algebra	MA.AI.10.3 Justify the steps used in simplifying expressions and solving equations and inequalities	MA.AI.10.3
	Algebra	MA.AI.10.9 Analyze transformations of lines and understand how the transformation are represented in equations	MA.AI.10.9
	Algebra	MA.AI.12.1 Compare data sets using statistical techniques (e.g., measures of central tendency, standard deviation, range, stem-and-leaf plots, and box-and-whisker graphs)	MA.AI.12.1
	Algebra	MA.AI.9.2 Compare and contrast the concepts of direct and inverse variation of a relation	MA.AI.9.2
	Algebra	MA.AI.9.4 Compare and contrast the properties of linear functions and exponential function	MA.AI.9.4
	Algebra II	MA.AII.10.10 Analyze translations and dilations for graphs of absolute value functions, parabolas, and circles, and understand how the transformations are represented in equations	MA.AII.10.10
	Geometry	MA.G.4.3 Determine the effect of dimension changes to perimeter, area, and volume for common geometric figures and solids	MA.G.4.3
	Geometry	MA.G.5.1 Use inductive and deductive reasoning to create and defend geometric conjectures	MA.G.5.1
Geometry	MA.G.5.2 Use the concept of corresponding parts to prove that triangles, and other polygons, are congruent or similar	MA.G.5.2	

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<b>Reasoning</b> Develop and use mathematical arguments and proofs to explore the truth of conjectures and justify conclusions.	Geometry	MA.G.8.1 Use coordinate geometry to produce formulas and prove theorems for the midpoint of a line segment, the distance formula, and forms of equations of lines and circles	MA.G.8.1
	Statistics	MA.S.11.1 Develop a hypothesis for an investigation or experiment	MA.S.11.1
	Statistics	MA.S.11.3 Select appropriate display for a data set (e.g., frequency table, histogram, line graph, bar graph, stem-and-leaf plot, box-and-whisker plot, scatter plot)	MA.S.11.3
	Statistics	MA.S.11.4 Recognize features of representations of data that can produce misleading interpretations	MA.S.11.4
	Statistics	MA.S.12.1 Use measures of central tendency and spread to interpret data	MA.S.12.1
	Statistics	MA.S.12.4 Use the line or curve of best fit to interpret data	MA.S.12.4
	Statistics	MA.S.13.2 Use interpolation and extrapolation to make predictions and inferences about data	MA.S.13.2
<b>Representation</b> Use and translate among representations including verbal, numerical, symbolic and graphical to communicate mathematical ideas and solve problems.	Algebra	MA.AI.10.2 Translate between verbal mathematical situations and algebraic expressions and equations	MA.AI.10.2
	Algebra	MA.AI.10.4 Determine the equation of a line when given the graph of the line, the slope and a point on the line, or two points on the line	MA.AI.10.4
	Algebra	MA.AI.12.2 Display bivariate data in a scatter plot, describe its shape, and determine the line of best fit that models a trend (if a trend exists)	MA.AI.12.2
	Algebra	MA.AI.3.1 Apply arithmetic properties to operate on and simplify expressions that include radicals and other real numbers	MA.AI.3.1
	Algebra	MA.AI.8.1 Graph linear equations using slope-intercept, point-slope, and x- and y-intercept techniques	MA.AI.8.1
	Algebra II	MA.AII.10.8 Add, subtract, multiply, divide, and simplify rational expressions, radical expressions containing positive rational numbers, and expressions containing rational exponents	MA.AII.10.8
	Algebra II	MA.AII.10.9 Translate between the equations of conic sections (e.g., circle, ellipse, parabola, hyperbola) and their graphs	MA.AII.10.9

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<b>Representation</b>	Algebra II	MA.AII.12.1 Identify trends in bivariate data and find functions that model the data	MA.AII.12.1
Use and translate among representations including verbal, numerical, symbolic and graphical to communicate mathematical ideas and solve problems.	Analytical Geometry	MA.AG.10.2 Translate between parametric representations of curves and equations using rectangular coordinates	MA.AG.10.2
	Analytical Geometry	MA.AG.9.1 Use the relationship among the properties of conic sections (e.g., asymptotes, center of a conic, directrix, eccentricity, focus, major and minor axis, vertex) and graph conic sections using the standard form of the equations	MA.AG.9.1
	Geometry	MA.G.7.1 Draw cross-sections, truncations, and compositions/decompositions of three-dimensional objects	MA.G.7.1

# PSAT/NMSQT Skills Insight™ Alignment to State Standards

## Executive Summary, July 2010

### Purpose

PSAT/NMSQT *Skills Insight*™ is a free online tool designed to help students and educators gain a better understanding of how PSAT/NMSQT® scores relate to specific academic skills. It provides a description of the academic skills that are typical of students scoring at each score band, suggestions for improvement, and practice test questions. Learn more by visiting [www.collegeboard.com/psatskills](http://www.collegeboard.com/psatskills).

The information provided by PSAT/NMSQT *Skills Insight* is organized by skill category. There are five skill categories for the critical reading section, nine for the mathematics section (4 content skill categories; 5 process skill categories), and 5 for the writing skills section. This report shows the alignment between state standards in English Language Arts and Mathematics and the content and skills measured by the PSAT/NMSQT.

### Using Alignment Results with PSAT/NMSQT Reports

Schools and districts that administer the PSAT/NMSQT have access to the *Summary of Answers and Skills* (SOAS) report<sup>1</sup>. SOAS reports summarize performance on test sections, skill categories, and individual test questions, and compare local results to the state or nation. Using SOAS and the alignment information provided in this report, schools and districts can develop remediation strategies to help students improve their college readiness skills, future SAT scores, and performance on state assessments.

### Mathematics: Alignment Approach and Findings

- There are nine Skills Categories in Mathematics, representing both content and process skills: *Number and Operations; Algebra and Functions; Geometry and Measurement; Data, Statistics and Probability; Problem Solving; Representation; Reasoning; Connections and Communication*.
- Only standards for grades 9-12 were considered for these alignments. Within grades 9-12, the areas with the greatest concentration of alignments are the Number and Operations, Algebra and Geometry strands of the state standards. In most cases, Precalculus and Trigonometry were excluded from the alignment study.
- The organization and hierarchy of standards varies on a state-by-state basis. During the alignment process, the College Board aligned the PSAT/NMSQT skills to the most specific level of the state's standards.
- States often integrate process and content standards. In such cases, the state standard received an alignment to both a process skill category and a content skill category.
- Generally, there is strong correspondence between the PSAT/NMSQT Skills Categories in Mathematics and state standards. Coverage of the Skills Categories across a state standards document is dependent upon the specific state standards and on the degree of specificity of language employed within the standards.
- The PSAT/NMSQT is administered to students in grades 10 and 11; consequently, the strongest areas of alignment are in the content categories of *Number and Operations, Algebra and Functions* and *Geometry and Measurement* and in the process categories of *Problem Solving, Reasoning* and *Representations*. Considering the design and purpose of the PSAT/NMSQT, extensive alignments in upper levels of high school mathematics standards, including Trigonometry, are not intended or expected.

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<sup>1</sup> Using the access code printed on the PSAT/NMSQT *Roster of Student Scores and Plans*, SOAS reports can be downloaded from [www.collegeboard.com/reports](http://www.collegeboard.com/reports) beginning in the first week of January.

- The College Board content specialists who conducted the alignments have a deep understanding of the PSAT/NMSQT test specifications. Therefore, although multiple Skills Categories might link to a particular standard, these alignments display only the strongest and most appropriate matches.

## English Language Arts: Alignment Approach and Findings

- Reading and Writing each have five PSAT/NMSQT Skills Categories. In Reading, the categories are *Determining the Meaning of Words*, *Author’s Craft*, *Reasoning and Inferencing*, *Organization and Ideas* and *Understanding Literary Elements*. In Writing, the categories are *Manage Word Choice and Grammatical Relationships Between Words*, *Manage Grammatical Structures Used to Modify or Compare*, *Manage Phrases and Clauses in a Sentence*; *Recognize Correctly Formed Sentences* and *Manage Order and Relationships of Sentences and Paragraphs*.
- The PSAT/NMSQT is administered to students in grades 10 and 11, and the College Board targeted the English Language Arts alignments at these specific grade levels. In states where the standards are organized by grade band (grades 9-10, 11-12) or by one high school band (grades 9-12), the College Board aligned to all high school grade levels.
- Given the purpose and design of the PSAT/NMSQT, the English Language Arts alignment is focused on the areas of reading and writing and does not include state standards in speaking, listening, or media literacy. Additionally, these alignments excluded genre-specific state standards (such as those related to American, British, or World literature), although the essential PSAT/NMSQT skills in Reading can be used to support instruction in literature.
- The organization and hierarchy of standards varies on a state-by-state basis. During the alignment process, the College Board aligned the PSAT/NMSQT skills to the most specific level of the state’s standards. Coverage of the Skills Categories across a state standards document is dependent upon the specific state standards and on the degree of specificity of language employed within the standards.
- In Writing, generally there is strong correspondence between the PSAT/NMSQT Skills Categories and state standards that focus on grammar, usage, language conventions, and the role of editing and revising in writing.
- In Reading, there is strong correspondence between the PSAT/NMSQT Skills Categories and state standards in the essential areas of vocabulary development (determine the meaning of unfamiliar words or of words with multiple meanings by understanding context and by analyzing roots, prefixes, and suffixes) and reading comprehension (determine the main idea and supporting details; understand the organization of passages; analyze the various elements of an author’s craft, including purpose, perspective, word choice, and use of rhetorical and literary devices and understand literary elements such as plot, characterization, and setting).

## Summary

In summary, the PSAT/NMSQT Skills Categories correspond well to state standards. Educators can use these alignments to connect the PSAT/NMSQT to their local curricula and state standards to monitor student learning and to build a coherent instructional plan for their students.