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Correlated to:
Connecticut Mathematics Curriculum Framework Companion, 2005
(Grades 9-12 Core and Extended)

CONNECTICUT MATHEMATICS CURRICULUM FRAMEWORK	PRENTICE HALL MATHEMATICS, GEOMETRY © 2009
Grades 9-12 CORE	
Algebraic Reasoning: Patterns And Functions	
Patterns and functional relationships can be represented and analyzed using a variety of strategies, tools and technologies.	
1.1 Understand and describe patterns and functional relationships	
a. Describe relationships and make generalizations about patterns and functions.	
(1) Identify, describe, create and generalize numeric, geometric and statistical patterns with tables, graphs, words and symbolic rules.	SE/TE: 4-9, 71, 74
(2) Make and justify predictions based on patterns.	SE/TE: 4-9, 71, 74
(3) Identify the characteristics of functions and relations, including domain and range.	SE/TE: 248
(4) Describe and compare properties and classes of linear, quadratic and exponential functions.	
1.2 Represent and analyze quantitative relationships in a variety of ways.	
a. Represent and analyze linear and nonlinear functions and relations symbolically and with tables and graphs.	
(1) Represent functions and relations on the coordinate plane.	SE/TE: 166-171, 191-192
(2) Identify an appropriate symbolic representation for a function or relation displayed graphically or verbally.	SE/TE: 166-171, 191-192
(3) Recognize and explain the meaning of the slope and x- and y-intercepts as they relate to a context, graph, table or equation.	SE/TE: 165-171, 191-192
(4) Evaluate and interpret the graphs of linear, exponential and polynomial functions.	SE/TE: 165-171, 191-192
1.3 Use operations, properties and algebraic symbols to determine equivalence and solve problems.	
a. Manipulate equations, inequalities and functions to solve problems.	
(1) Model and solve problems with linear, quadratic and absolute value equations and linear inequalities.	
(2) Determine equivalent representations of an algebraic equation or inequality to simplify and solve problems.	SE/TE: 30
(3) Solve systems of two linear equations using algebraic or graphical methods.	SE/TE: 234

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CONNECTICUT MATHEMATICS CURRICULUM FRAMEWORK	PRENTICE HALL MATHEMATICS, GEOMETRY © 2009
Numerical and Proportional Reasoning	
Quantitative relationships can be expressed numerically in multiple ways in order to make connections and simplify calculations using a variety of strategies, tools and technologies.	
2.1 Understand that a variety of numerical representations can be used to describe quantitative relationships.	
a. Extend the understanding of number to include integers, rational numbers and real numbers.	
(1) Compare, locate, label and order real numbers on number lines, scales, coordinate grids and measurement tools.	SE/TE: 31-35, 72, 74
(2) Select and use an appropriate form of number (integer, fraction, decimal, ratio, percent, exponential, scientific notation, irrational) to solve practical problems involving order, magnitude, measures, labels, locations and scales.	SE/TE: 31-35, 72, 74
b. Interpret and represent large sets of numbers with the aid of technologies.	
(1) Use technological tools such as spreadsheets, probes, computer algebra systems and graphing utilities to organize and analyze large amounts of numerical information.	SE/TE: 69
2.2 Use numbers and their properties to compute flexibly and fluently, and to reasonably estimate measures and quantities.	
a. Develop strategies for computation and estimation using properties of number systems to solve problems.	
(1) Select and use appropriate methods for computing to solve problems in a variety of contexts.	SE/TE: 69
(2) Solve problems involving scientific notation and absolute value.	
(3) Develop and use a variety of strategies to estimate values of formulas, functions and roots; to recognize the limitations of estimation; and to judge the implications of the results.	SE/TE: 41 (#35-50), 66 (#41)
b. Solve proportional reasoning problems.	
(1) Use dimensional analysis to determine equivalent rates.	SE/TE: 574
(2) Solve problems using direct and inverse variation.	

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Geometry and Measurement	
Shapes and structures can be analyzed, visualized, measured and transformed using a variety of strategies, tools and technologies.	
3.1 Use properties and characteristics of two- and three-dimensional shapes and geometric theorems to describe relationships, communicate ideas and solve problems.	
a. Investigate relationships among plane and solid geometric figures using geometric models, constructions and tools.	
(1) Use models and constructions to make, test and summarize conjectures involving properties of geometric figures.	SE/TE: 5-9, 44-51, 71, 73-74
(2) Use geometric properties to solve problems in two and three dimensions.	SE/TE: 598-651, 653-656
(3) Determine and compare properties of classes of polygons.	SE/TE: 157-165, 191-192
b. Develop and evaluate mathematical arguments using reasoning and proof.	
(1) Recognize the validity of an argument.	SE/TE: 5-9, 71, 74, 94-109, 118-120
(2) Create logical arguments to solve problems and determine geometric relationships.	SE/TE: 94-109, 118-120
3.2 Use spatial reasoning, location and geometric relationships to solve problems.	
a. Verify geometric relationships using algebra, coordinate geometry, and transformations.	
(1) Interpret geometric relationships using algebraic equations and inequalities, and vice versa.	SE/TE: 30-35, 72, 74, 104-109, 119-120, 288-295, 299-300
(2) Describe how a change in measurement of one or more parts of a polygon or solid may affect its perimeter, area, surface area and volume and make generalizations for similar figures.	SE/TE: 646-651, 655-656
(3) Apply transformations to plane figures to determine congruence, similarity, symmetry and tessellations.	SE/TE: 198-203, 249, 252, 492-497, 513-521, 525-526
3.3 Develop and apply units, systems, formulas and appropriate tools to estimate and measure.	
a. Solve a variety of problems involving 1-, 2- and 3-dimensional measurements using geometric relationships and trigonometric ratios.	
(1) Select appropriate units, scales, degree of precision, and strategies to determine length, angle measure, perimeter, circumference and area of plane geometric figures.	SE/TE: 31-43, 60-69, 72-74
(2) Use indirect methods including the Pythagorean Theorem, trigonometric ratios and proportions in similar figures to solve a variety of measurement problems.	SE/TE: 373-381, 391-405, 408-410
(3) Judge the reasonableness of answers to direct and indirect measurement problems.	SE/TE: 391-405, 408-410

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(4) Use two-dimensional representations and formal and informal methods to solve surface-area and volume problems.	SE/TE: 608-644, 654-656
Working with Data: Probability and Statistics	
Data can be analyzed to make informed decisions using a variety of strategies, tools and technologies.	
4.1 Collect, organize and display data using appropriate statistical and graphical methods.	
a. Create the appropriate visual or graphical representation of real data.	
(1) Collect real data and create meaningful graphical representations of the data.	SE/TE: 412-413
(2) Develop, use and explain applications and limitations of linear and nonlinear models and regression in a variety of contexts.	SE/TE: 76-77
4.2 Analyze data sets to form hypotheses and make predictions.	
a. Analyze real- world problems using statistical techniques.	
(1) Estimate an unknown value between data points on a graph (interpolation) and make predictions by extending the graph (extrapolation).	
(2) Use data from samples to make inferences about a population and determine whether claims are reasonable or false.	SE/TE: 594-595
(3) Determine and use measures of spread and central tendency to describe and compare sets of data.	
4.3 Understand and apply basic concepts of probability.	
a. Understand and apply the principles of probability in a variety of situations.	
(1). Determine outcomes and solve problems involving the probabilities of events.	SE/TE: 582-587, 591-592
(2) Explore the concepts of conditional probability in real-world contexts.	SE/TE: 22 (#77-79)
(3) Apply theoretical and experimental probabilities appropriately to solve problems and predict experimental results.	SE/TE: 582-587, 591-592

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CONNECTICUT MATHEMATICS CURRICULUM FRAMEWORK	PRENTICE HALL MATHEMATICS, ALGEBRA 1 © 2009
Grades 9-12 EXTENDED	
Algebraic Reasoning: Patterns And Functions	
Patterns and functional relationships can be represented and analyzed using a variety of strategies, tools and technologies.	
1.1 Understand and describe patterns and functional relationships	
a. Model real-world situations and make generalizations about mathematical relationships using a variety of patterns and functions.	
(1) Describe and compare properties and classes of functions, including exponential, polynomial, rational, logarithmic and trigonometric.	
(2) Analyze essential relations in a problem to determine possible functions that could model the situation.	
(3) Explore conic sections and their applications graphically and symbolically.	
(4) Solve problems involving financial applications including compound interest, amortization of loans, and investments.	
(5) Solve problems involving direct and inverse variation.	
(6) Understand and use optimization strategies, including linear programming.	
(7) Apply the concepts of limits to sequences and asymptotic behavior of functions.	
1.2 Represent and analyze quantitative relationships in a variety of ways.	
a. Relate the behavior of functions and relations to specific parameters and determine functions to model real-world situations.	
(1) Relate the graphical representation of a function to its function family and find equations, intercepts, maximum or minimum values, asymptotes and line of symmetry for that function.	SE/TE: 165-171, 191-192
(2) Recognize the effect of changes in parameters on the graphs of functions or relations.	SE/TE: 165-171, 191-192
(3) Recognize that the slope of the tangent line to a curve represents the rate of change.	
(4) Represent functions and relations with polar coordinates and in the complex plane.	
1.3 Use operations, properties and algebraic symbols to determine equivalence and solve problems.	
a. Use and extend algebraic concepts to include real and complex numbers, vectors and matrices.	
(1) Determine equivalent representations of an algebraic equation or inequality to simplify and solve problems.	SE/TE: 30
(2) Combine, compose and invert functions.	

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(3) Use logarithms, vectors and matrices to solve problems.	SE/TE: 452-459, 463-464
Numerical and Proportional Reasoning	
Quantitative relationships can be expressed numerically in multiple ways in order to make connections and simplify calculations using a variety of strategies, tools and technologies.	
2.1 Understand that a variety of numerical representations can be used to describe quantitative relationships.	
a. Extend the understanding of number to include the set of complex numbers.	
(1) Compare and contrast the properties of numbers and number systems, including rational, real and complex numbers.	SE/TE: 31-35, 72, 74
(2) Select and use an appropriate form of number (integer, fraction, decimal, ratio, percent, exponential, scientific notation, irrational, complex) to solve practical problems involving order, magnitude, measures, labels, locations and scales.	SE/TE: 31-35, 72, 74
(3) Justify mathematical procedures and determine how they apply to invented operations using field properties (closure, associative, commutative, distributive, identity and inverse).	SE/TE: 103-109, 118-120
(4) Judge the effects of computations with powers and roots on the magnitude of results.	SE/TE: 452-459, 463-464
2.2 Use numbers and their properties to compute flexibly and fluently, and to reasonably estimate measures and quantities.	
a. Investigate mathematical properties and operations related to objects that are not numbers.	
(1) Recognize vectors and matrices as systems that have some, but not all, of the properties of real numbers.	SE/TE: 452-459, 463-464
(2) Perform operations with complex numbers, matrices, determinants and logarithms.	
Geometry and Measurement	
Shapes and structures can be analyzed, visualized, measured and transformed using a variety of strategies, tools and technologies.	
3.1 Use properties and characteristics of two- and three-dimensional shapes and geometric theorems to describe relationships, communicate ideas and solve problems.	
a. Use methods of deductive and inductive reasoning to make, test and validate geometric conjectures.	
(1) Recognize the relationships between a conditional statement and its converse, inverse and contrapositive.	SE/TE: 80-94, 117-118, 120
(2) Test the validity of logical arguments.	SE/TE: 80-101, 117, 120
(3) Use deductive arguments, including direct and indirect proofs, to develop an understanding of an axiomatic approach to geometry.	SE/TE: 95-101, 118, 120

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b. Explore non-Euclidean geometries.	
(1) Recognize that the familiar geometry of Euclid is based on a particular set of axioms and that a different set of axioms would lead to a different geometry.	SE/TE: 154-155
3.2 Use spatial reasoning, location and geometric relationships to solve problems.	
a. Use a variety of coordinate systems and transformations to solve geometric problems in two- and three-dimensions using appropriate tools and technologies	
(1) Visualize three-dimensional objects from different perspectives and analyze cross-sections, surface area and volume.	SE/TE: 598-644, 653-656
(2) Use Cartesian, navigational, polar and spherical systems to represent, analyze and solve geometric and measurement problems.	
(3) Represent translations, reflections, rotations and dilations of plane figures using sketches, coordinates, vectors, function notation and matrices to examine the effects of transformations and their composites and to solve related geometric problems.	SE/TE: 470-491, 498-521, 523-526
3.3 Develop and apply units, systems, formulas and appropriate tools to estimate and measure.	
a. Approximate measurements that cannot be directly determined with some degree of precision using appropriate tools, techniques and strategies.	
(1) Use successive approximation, upper and lower bounds, and limits to solve measurement problems.	
(2) Use properties of similarity and techniques of trigonometry to make indirect measurements of lengths and angles to solve a variety of problems.	SE/TE: 373-381, 391-405, 408-410
Working with Data: Probability and Statistics	
Data can be analyzed to make informed decisions using a variety of strategies, tools and technologies.	
4.1 Collect, organize and display data using appropriate statistical and graphical methods.	
a. Model real data graphically using appropriate tools, technology and strategies.	
(1) Investigate and solve relevant problems by designing statistical experiments and collecting, organizing, displaying and analyzing data in tabular, graphical and symbolic forms.	SE/TE: 412-413
(2) Apply and defend regression models for bivariate data and use them to formulate predictions.	SE/TE: 76-77
(3) Recognize the limitations of mathematical models based on sample data as representations of real-world situations.	SE/TE: 76-77, 594-595

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4.2 Analyze data sets to form hypotheses and make predictions.	
a. Describe and analyze sets of data using statistical models.	
(1) Determine statistical measures to describe univariate data.	SE/TE: 412-413
(2) Describe characteristics of sampling methods and analyze the effects of random versus biased sampling.	SE/TE: 76-77, 412-413, 594-595
4.3 Understand and apply basic concepts of probability.	
a. Solve problems using the methods of discrete mathematics.	
(1) Understand and use permutations, combinations, recursion and mathematical induction to solve problems.	SE/TE: 4-9, 71, 74
(2) Solve problems using finite graphs.	
b. Make statistical inferences through the use of probability.	
(1) Explore the characteristics and applications of the normal distribution and standardized scores.	
(2) Construct and interpret confidence intervals.	
(3) Explore a variety of statistical tests such as chi-squares and t-tests and understand the meaning of hypothesis testing.	
(4) Use relative frequency and expected values to represent and solve problems involving uncertainty.	