ALGEBRA IIA FOUNDATIONS CURRICULUM FRAMEWORKS

ALGEBRA (encompasses 45-52% of MCA test items)			
Standard 1: Understand the concept of function, and identify important features of functions and other relations using symbolic and graphical methods where appropriate.			
Curriculum Benchmark	**MCA III Test Item Specifications**	**Where Benchmark is Taught/Assessed in Holt "Algebra 2" Student Edition**	**Notes**
Understand the definition of a function. Use functional notation and evaluate a function at a given point in its domain. (9.2.1.1) For example: If $f(x)=\frac{1}{x^2-3}$, find $f(-4)$.	• Vocabulary allowed in items: relation, domain, range and vocabulary given at previous grades	McDougal Littell "Algebra 2 Concepts and Skills" 2010 SE pages: 67-72, 73-78, 85, 115, 116, 119, 120, 204-210, 214, 214, 266, 334, 374-375, 376, 377, 378, 389-393	
Distinguish between functions and other relations defined symbolically, graphically or in tabular form. (9.2.1.2)	• Vocabulary allowed in items: relation, domain, range and vocabulary given at previous grades	McDougal Littell "Algebra 2 Concepts and Skills" 2010 SE pages: 73, 76, 302-303, 305, 364	
Find the domain of a function defined symbolically, graphically or in a real-world context. (9.2.1.3) For example: The formula $f(x) = \pi x^2$ can represent a function whose domain is all real numbers, but in the context of the area of a circle, the domain would be restricted to positive x.	• Vocabulary allowed in items: relation, domain, range and vocabulary given at previous grades	McDougal Littell "Algebra 2 Concepts and Skills" 2010 SE pages: 389-393, 403, 404, 405, 425, 437, 459, 471, 514, 613	
Identify the vertex, line of symmetry and intercepts of the parabola corresponding to a quadratic function, using symbolic and graphical methods, when the function is expressed in the form $f(x) = ax^2 + bx + c$, in the form $f(x) = a(x - h)^2 + k$, or in factored form. (9.2.1.5)	• Vocabulary allowed in items: line of symmetry, parabola, quadratic, vertex and vocabulary given at previous grades	McDougal Littell "Algebra 2 Concepts and Skills" 2010 SE pages: 221, 222-227, 228-233, 239, 247, 270, 271, 285, 286, 289, 290, 689, 696	
Determine how translations affect the symbolic and graphical forms of a function. Know how to use graphing technology to examine translations. (9.2.1.9) For example: Determine how the graph of $f(x) = \|x - h\| + k$ changes as h and k change.	• Vocabulary allowed in items: vocabulary given at previous grades	McDougal Littell "Algebra 2 Concepts and Skills" 2010 SE pages: 388-394, 413-417, 420-421, 423-424, 724-730, 760-761	

ALGEBRA IIA FOUNDATIONS CURRICULUM FRAMEWORKS

ALGEBRA (encompasses 45-52% of MCA test items) (continued)			
Standard 2: Recognize linear, quadratic, exponential and other common functions in real-world and mathematical situations; represent these functions with tables, verbal descriptions, symbols and graphs; solve problems involving these functions, and explain results in the original context.			
Curriculum Benchmark	**MCA III Test Item Specifications**	**Where Benchmark is Taught/Assessed in Holt "Algebra 2" Student Edition**	**Notes**
Sketch graphs of linear, quadratic and exponential functions, and translate between graphs, tables and symbolic representations. Know how to use graphing technology to graph these functions. (9.2.2.3)	• Items do not require the use of graphing technology • Vocabulary allowed in items: quadratic, exponential and vocabulary given at previous grades	McDougal Littell "Algebra 2 Concepts and Skills" 2010 SE pages: 86, 87-92, 93, 101-105, 117, 119, 131, 166, 222-227, 228-233, 378	
Express the terms in a geometric sequence recursively and by giving an explicit (closed form) formula, and express the partial sums of a geometric series recursively. (9.2.2.4) For example: A closed form formula for the terms t_n in the geometric sequence 3, 6, 12, 24, ... is $t_n = 3(2)^{n-1}$, where $n = 1, 2, 3, \ldots$, and this sequence can be expressed recursively by writing $t_1 = 3$ and $t_n = 2t_{n-1}$, for $n \geq 2$. Another example: The partial sums s_n of the series $3 + 6 + 12 + 24 + \ldots$ can be expressed recursively by writing $s_1 = 3$ and $s_n = 3 + 2s_{n-1}$, for $n \geq 2$.	• Vocabulary allowed in items: recursive, geometric series and vocabulary given at previous grades	McDougal Littell "Algebra 2 Concepts and Skills" 2010 SE pages: 621-626, 627, 628-634, 638, 639, 641, 674, 681, 741	
Sketch the graphs of common non-linear functions such as $f(x)=\sqrt{x}$, $f(x)=\lvert x\rvert$, $f(x)=\frac{1}{x}$, $f(x) = x^3$, and translations of these functions, such as $f(x)=\sqrt{x-2}+4$. Know how to use graphing technology to graph these functions. (9.2.2.6)	• Vocabulary allowed in items: vocabulary given at previous grades	McDougal Littell "Algebra 2 Concepts and Skills" 2010 SE pages: 204, 208, 209, 210, 211, 302-308, 388, 407, 417, 456	

ALGEBRA IIA FOUNDATIONS CURRICULUM FRAMEWORKS

ALGEBRA (encompasses 45-52% of MCA test items) (continued)			
Standard 3: Generate equivalent algebraic expressions involving polynomials and radicals; use algebraic properties to evaluate expressions.			
Curriculum Benchmark	**MCA III Test Item Specifications**	**Where Benchmark is Taught/Assessed in Holt "Algebra 2" Student Edition**	**Notes**
Evaluate polynomial and rational expressions and expressions containing radicals and absolute values at specified points in their domains. (9.2.3.1)	• Vocabulary allowed in items: polynomial and vocabulary given at previous grades	McDougal Littell "Algebra 2 Concepts and Skills" 2010 SE pages: 361, 363, 364, 371, 402, 405, 406, 544	
Add, subtract and multiply polynomials; divide a polynomial by a polynomial of equal or lower degree. (9.2.3.2)	• Vocabulary allowed in items: polynomial, degree of a polynomial and vocabulary given at previous grades	McDougal Littell "Algebra 2 Concepts and Skills" 2010 SE pages: 16-21, 58, 61, 62, 78, 166, 224, 226, 233, 310-314, 315-321, 334, 342, 343, 345, 346, 348, 349, 353, 378, 464, 492, 514, 613, 775, 776	
Factor common monomial factors from polynomials, factor quadratic polynomials, and factor the difference of two squares. (9.2.3.3) For example: $9x^6 - x^4 = (3x^3 - x^2)(3x^3 + x^2)$.	• Vocabulary allowed in items: polynomial, monomial and vocabulary given at previous grades	McDougal Littell "Algebra 2 Concepts and Skills" 2010 SE pages: 234-239, 240-248, 249-254, 267, 286, 287, 289, 290, 301, 321, 322, 329, 605	
Apply the properties of positive and negative rational exponents to generate equivalent algebraic expressions, including those involving n^{th} roots. (9.2.3.6) For example: $\sqrt{2}\times\sqrt{7}=2^{\frac{1}{2}}\times7^{\frac{1}{2}}=14^{\frac{1}{2}}=\sqrt{14}$. Rules for computing directly with radicals may also be used: $\sqrt[3]{2}\times\sqrt[3]{x}=\sqrt[3]{2x}$.	• Vocabulary allowed in items: n^{th} root and vocabulary given at previous grades	McDougal Littell "Algebra 2 Concepts and Skills" 2010 SE pages: 255-256, 258, 260, 266, 297-301, 308, 341, 345, 346, 349, 353-358, 359-364, 382-386, 387, 401, 402, 415, 406, 406, 410, 417, 432, 439, 471, 478, 681, 740	

ALGEBRA IIA FOUNDATIONS CURRICULUM FRAMEWORKS

ALGEBRA (encompasses 45-52% of MCA test items) (continued)			
Standard 4: Represent real-world and mathematical situations using equations and inequalities involving linear, quadratic, exponential and n^{th} root functions. Solve equations and inequalities symbolically and graphically. Interpret solutions in the original context.			
Curriculum Benchmark	**MCA III Test Item Specifications**	**Where Benchmark is Taught/Assessed in Holt "Algebra 2" Student Edition**	**Notes**
Represent relationships in various contexts using quadratic equations and inequalities. Solve quadratic equations and inequalities by appropriate methods including factoring, completing the square, graphing and the quadratic formula. Find non-real complex roots when they exist. Recognize that a particular solution may not be applicable in the original context. Know how to use calculators, graphing utilities or other technology to solve quadratic equations and inequalities. (9.2.4.1) For example: A diver jumps from a 20 meter platform with an upward velocity of 3 meters per second. In finding the time at which the diver hits the surface of the water, the resulting quadratic equation has a positive and a negative solution. The negative solution should be discarded because of the context.	• Vocabulary allowed in items: quadratic, n^{th} root and vocabulary given at previous grades	McDougal Littell "Algebra 2 Concepts and Skills" 2010 SE pages: 236, 237, 238, 245-246, 247, 248, 251, 253, 254, 255-260, 269, 270, 271, 272, 273, 274-281, 282-284, 285-288, 289, 290-291, 314, 328, 340, 349, 514, 697-702, 703-708, 709, 710-716, 717-722, 723, 724-731, 733-736, 737, 738-739, 741	
Represent relationships in various contexts using systems of linear inequalities; solve them graphically. Indicate which parts of the boundary are included in and excluded from the solution set using solid and dotted lines. (9.2.4.4)	• Vocabulary allowed in items: boundary and vocabulary given at previous grades	McDougal Littell "Algebra 2 Concepts and Skills" 2010 SE pages: 185-191, 213, 216, 217, 260, 650	
Solve linear programming problems in two variables using graphical methods with equations given. (9.2.4.5)	• Vocabulary allowed in items: constraint, boundary, feasible region and vocabulary given at previous grades	(The standard is not addressed in this textbook.)	

ALGEBRA IIA FOUNDATIONS CURRICULUM FRAMEWORKS

DATA ANALYSIS AND PROBABILITY (encompasses 18-26% of MCA test items)			
Standard 1: Display and analyze data; use various measures associated with data to draw conclusions, identify trends and describe relationships.			
Curriculum Benchmark	**MCA III Test Item Specifications**	**Where Benchmark is Taught/Assessed in Holt "Algebra 2" Student Edition**	**Notes**
Use scatterplots to analyze patterns and describe relationships between two variables. Using technology, determine regression lines (line of best fit) and correlation coefficients; use regression lines to make predictions and correlation coefficients to assess the reliability of those predictions. (9.4.1.3)	• Vocabulary allowed in items: regression line, correlation coefficient and vocabulary given at previous grades	McDougal Littell "Algebra 2 Concepts and Skills" 2010 SE pages: 107-113, 114, 118, 119, 121, 167, 177	

ALGEBRA IIA FOUNDATIONS CURRICULUM FRAMEWORKS

DATA ANALYSIS AND PROBABILITY (encompasses 18-26% of MCA test items) (continued)			
Standard 2: Explain the uses of data and statistical thinking to draw inferences, make predictions and justify conclusions.			
Curriculum Benchmark	**MCA III Test Item Specifications**	**Textbook Correlation**	**Notes**
Identify and explain misleading uses of data; recognize when arguments based on data confuse correlation and causation. (9.4.2.2)	• Vocabulary allowed in items: causation and vocabulary given at previous grades	(The standard is not addressed in this textbook.)	