

FORMAT FOR CORRELATION TO THE GEORGIA PERFORMANCE STANDARDS

Subject Area: Mathematics 3 **State-Funded Course:** Mathematics 3

Textbook Title: MathConnections: Year 3a & Year 3b

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The GPSs for grades K-12 Science and 9-12 Mathematics may be accessed on-line at: <http://www.georgiastandards.org/>.

<u>Standard</u> (Cite Number)	<u>Standard</u> (Cite specific standard)	<u>Where Taught</u> (If print component, cite page number; if non-print, cite appropriate location.)
MM3A1.	Students will analyze graphs of polynomial functions of higher degree.	
MM3A1.a	Graph simple polynomial functions as translations of the function $f(x) = ax^n$.	Book 3a: pp. 30 – 36
MM3A1.b	Understand the effects of the following on the graph of a polynomial function: degree, lead coefficient, and multiplicity of real zeros.	Book 3a: pp. 38 – 47
MM3A1.c	Determine whether a polynomial function has symmetry and whether it is even, odd, or neither.	Book 3a: pp. 26 – 28, 40 – 41
MM3A1.d	Investigate and explain characteristics of polynomial functions, including domain and range, intercepts, zeros, relative and absolute extrema, intervals of increase and decrease, and end behavior.	Book 3a: pp. 5, 10, 13, 15 – 29, 36, 38, 39, 44 – 47

<p>MM3A2.</p> <p>MM3A2.a</p> <p>MM3A2.b</p> <p>MM3A2.c</p> <p>MM3A2.d</p> <p>MM3A2.e</p> <p>MM3A2.f</p> <p>MM3A2.g</p>	<p>Students will explore logarithmic functions as inverses of exponential functions.</p> <p>Define and understand the properties of n^{th} roots.</p> <p>Extend properties of exponents to include rational exponents.</p> <p>Define logarithmic functions as inverses of exponential functions.</p> <p>Understand and use properties of logarithms by extending laws of exponents.</p> <p>Investigate and explain characteristics of exponential and logarithmic functions including domain and range, asymptotes, zeros, intercepts, intervals of increase and decrease, and rate of change.</p> <p>Graph functions as transformations of $f(x) = a^x$, $f(x) = \log_a x$, $f(x) = e^x$, $f(x) = \ln x$.</p> <p>Explore real phenomena related to exponential and logarithmic functions including half-life and doubling time.</p>	<p>Book 3a: pp. 3 – 47, 84 – 140</p> <p>Book 3a: pp. 3 – 47, 84 – 140</p> <p>Book 3a: pp. 87 – 109, 120 – 140</p>
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MM3A3.	Students will solve a variety of equations and inequalities.	
MM3A3.a	Find real and complex roots of higher degree polynomial equations using the factor theorem, remainder theorem, rational root theorem, and fundamental theorem of algebra, incorporating complex and radical conjugates.	
MM3A3.b	Solve polynomial, exponential, and logarithmic equations analytically, graphically, and using appropriate technology.	
MM3A3.c	Solve polynomial, exponential, and logarithmic inequalities analytically, graphically, and using appropriate technology. Represent solution sets of inequalities using interval notation.	
MM3A3.d	Solve a variety of types of equations by appropriate means choosing among mental calculation, pencil and paper, or appropriate technology.	
MM3A4.	Students will perform basic operations with matrices.	
MM3A4.a	Add, subtract, multiply, and invert matrices, when possible, choosing appropriate methods, including technology.	
MM3A4.b	Find the inverses of two-by-two matrices using pencil and paper, and find inverses of larger matrices using technology.	

MM3A4.c	Examine the properties of matrices, contrasting them with properties of real numbers.	
MM3A5.	Students will use matrices to formulate and solve problems.	
MM3A5.a	Represent a system of linear equations as a matrix equation.	
MM3A5.b	Solve matrix equations using inverse matrices.	
MM3A5.c	Represent and solve realistic problems using systems of linear equations.	Book 3b: pp. 316 – 357
MM3A6.	Students will solve linear programming problems in two variables.	
MM3A6.a	Solve systems of inequalities in two variables, showing the solutions graphically.	Book 3b: pp. 316 – 357
MM3A6.b	Represent and solve realistic problems using linear programming.	Book 3b: pp. 316 – 357
MM3A7.	Students will understand and apply matrix representations of vertex-edge graphs.	
MM3A7.a	Use graphs to represent realistic situations.	Book 3b: pp. 316 – 357

MM3A7.b	Use matrices to represent graphs, and solve problems that can be represented by graphs.	
MM3G1.	Students will investigate the relationships between lines and circles.	
MM3G1.a	Find equations of circles.	
MM3G1.b	Graph a circle given an equation in general form.	
MM3G1.c	Find the equation of a tangent line to a circle at a given point.	
MM3G1.d	Solve a system of equations involving a circle and a line.	Book 3a: 163, 167
MM3G1.e	Solve a system of equations involving two circles.	
MM3G2.	Students will recognize, analyze, and graph the equations of the conic sections (parabolas, circles, ellipses, and hyperbolas).	
MM3G2.a	Convert equations of conics by completing the square.	Book 3a: pp. 19 – 22
MM3G2.b	Graph conic sections, identifying fundamental characteristics.	Book 3a: pp. 30 – 36
MM3G2.c	Write equations of conic sections given appropriate information.	Book 3a pp. 32 – 36

MM3G3.	Students will investigate planes and spheres.	
MM3G3.a	Plot the point (x, y, z) and understand it as a vertex of a rectangular prism.	
MM3G3.b	Apply the distance formula in 3-space.	
MM3G3.c	Recognize and understand equations of planes and spheres.	
MM3D1.	Students will create probability histograms of discrete random variables, using both experimental and theoretical probabilities.	Book 3a: pp. 358 – 362
MM3D2.	Students will solve problems involving probabilities by interpreting a normal distribution as a probability histogram for a continuous random variable (z-scores are used for a general normal distribution).	
MM3D2.a	Determine intervals about the mean that include a given percent of data.	Book 3a: pp. 280 – 295
MM3D2.b	Determine the probability that a given value falls within a specified interval.	Book 3a: pp. 278, 279
MM3D2.c	Estimate how many items in a population fall within a specified interval.	Book 3a: 292, 295

MM3D3.	Students will understand the differences between experimental and observational studies by posing questions and collecting, analyzing, and interpreting data.	
MM3P1.	Students will solve problems (using appropriate technology).	
MM3P1.a	Build new mathematical knowledge through problem solving.	Book 3a: pp. 45, 46, 88, 104, 123, 205 – 209, 214 Book 3b: pp. 451, 454 – 457, 501 – 501
MM3P1.b	Solve problems that arise in mathematics and in other contexts.	Book 3a: pp. 89, 99, 100, 127 – 130, 187, 217, 262, 572 Book 3b: pp. 316 – 357, 426 – 428, 434, 435, 549, 550, 553, 597
MM3P1.c	Apply and adapt a variety of appropriate strategies to solve problems.	Book 3a: pp. 109, 113 – 118, 148, 149, 163 – 179 Book 3b: pp. 454 – 457, 604
MM3P1.d	Monitor and reflect on the process of mathematical problem solving.	Book 3a: pp. 13, 15, 24, 57, 58, 83, 91, 92, 108, 133, 215 Book 3b: pp. 333
MM3P2.	Students will reason and evaluate mathematical arguments.	
MM3P2.a	Recognize reasoning and proof as fundamental aspects of mathematics.	Book 3a: pp. 80, 88, 91 Book 3b: pp. 389, 391 – 394, 417 – 423, 436, 445, 452, 461, 462, 466, 477, 479, 483 – 487, 497, 498, 512, 523, 540, 547, 548, 552, 572 – 581, 600 – 602
MM3P2.b	Make and investigate mathematical conjectures.	Book 3a: pp. 109, 113 – 118, 148, 149, 163 – 179 Book 3b: pp. 454 – 457, 604

MM3P2.c	Develop and evaluate mathematical arguments and proofs.	Book 3a: pp. 80, 88, 91 Book 3b: pp. 389, 391 – 394, 417 – 423, 436, 445, 452, 461, 462, 466, 477, 479, 483 – 487, 497, 498, 512, 523, 540, 547, 548, 552, 572 – 581, 600 – 602
MM3P2.d	Select and use various types of reasoning and methods of proof.	Book 3a: pp. 80, 88, 91 Book 3b: pp. 389, 391 – 394, 417 – 423, 436, 445, 452, 461, 462, 466, 477, 479, 483 – 487, 497, 498, 512, 523, 540, 547, 548, 552, 572 – 581, 600 – 602
MM3P3.	Students will communicate mathematically.	
MM3P3.a	Organize and consolidate their mathematical thinking through communication.	Book 3a: pp. 26, 51 Book 3b: pp. 588 – 590
MM3P3.b	Communicate their mathematical thinking coherently and clearly to peers, teachers, and others.	Book 3a: pp. 42, 96, 116, 117, 122, 135, 144, 261 Book 3b: pp. 388, 399, 490, 538, 550, 593, 602
MM3P3.c	Analyze and evaluate the mathematical thinking and strategies of others.	
MM3P3.d	Use the language of mathematics to express mathematical ideas precisely.	Book 3a: pp. 42, 96, 116, 117, 122, 135, 144, 261 Book 3b: pp. 388, 399, 490, 538, 550, 593, 602
MM3P4.	MM2P4. Students will make connections among mathematical ideas and to other disciplines.	
MM3P4.a	Recognize and use connections among mathematical ideas.	Book 3a: pp. 37 – 39 Book 3b: pp. 371 – 382, 454 – 457, 462, 472, 494, 500 – 504, 508, 522 – 523, 532

MM3P4.b	Understand how mathematical ideas interconnect and build on one another to produce a coherent whole.	Book 3a: pp. 37 – 39 Book 3b: pp. 371 – 382, 454 – 457, 462, 472, 494, 500 – 504, 508, 522 – 523, 532
MM3P4.c	Recognize and apply mathematics in contexts outside of mathematics.	Book 3a: pp. 89, 99, 100, 127 – 130, 187, 217, 262, 572 Book 3b: pp. 316 – 357, 426 – 428, 434, 435, 549, 550, 553, 597
MM3P5.	MM2P5. Students will represent mathematics in multiple ways.	
MM3P5.a	Create and use representations to organize, record, and communicate mathematical ideas.	Book 3a: pp. 37 – 38, 163 – 174 Book 3b: pp. 389 – 393, 494, 500 – 504, 432, 433, 458, 500 – 501, 589, 590
MM3P5.b	Select, apply, and translate among mathematical representations to solve problems.	Book 3a: pp. 66 , 79, 81, 98, 106, 122, 237 Book 3b: pp. 334 – 338, 350, 361
MM3P5.c	Use representations to model and interpret physical, social, and mathematical phenomena.	Book 3a: pp. 89, 99, 100, 127 – 130, 187, 217, 262, 572 Book 3b: pp. 316 – 357, 426 – 428, 434, 435, 549, 550, 553, 597
MRC.	MRC. Students will enhance reading in all curriculum areas by:	
MRC.a	Reading in all curriculum areas <ul style="list-style-type: none"> • Read a minimum of 25 grade-level appropriate books per year from a variety of subject disciplines and participate in discussions related to curricular learning in all areas • Read both informational and fictional texts in a variety of genres and modes of 	All sections, all texts

<p>MRC.b</p>	<p>discourse</p> <ul style="list-style-type: none"> • Read technical texts related to various subject areas <p>Discussing books</p> <ul style="list-style-type: none"> • Discuss messages and themes from books in all subject areas. • Respond to a variety of texts in multiple modes of discourse. • Relate messages and themes from one subject area to messages and themes in another area. • Evaluate the merit of texts in every subject discipline. • Examine author’s purpose in writing. • Recognize the features of disciplinary texts. 	<p>All sections, all texts</p>
<p>MRC.c</p>	<p>Building vocabulary knowledge</p> <ul style="list-style-type: none"> • Demonstrate an understanding of contextual vocabulary in various subjects. • Use content vocabulary in writing and speaking. • Explore understanding of new words found in subject area texts. 	<p>Book 3a: 5 – 6, 14, 23 – 24, 39, 110 – 112, 135, 147, 153 – 159 Book 3b: pp. 317 – 320, 335 – 337, 362 – 365, 388 – 391, 395 – 398, 400 – 405, 410, 417 – 419, 431 – 432, 437 – 440, 464, 488 – 489, 546 – 547, 583 – 586, 591</p>
<p>MRC.d</p>	<p>Establishing context</p> <ul style="list-style-type: none"> • Explore life experiences related to subject area content. • Discuss in both writing and speaking how certain words are subject area related. • Determine strategies for finding content and contextual meaning for unknown words. 	<p>Book 3a: pp. 3 – 18, 24 , 25, 29, 35 – 44, 47 – 49, 53 – 57, 61 – 63, 66, 84 – 107, 131 – 151, 191 – 195, 205 – 209, 212, 217 –218, 234, 251 – 252, 257, 262, 282, 283, 286 – 295 Book 3b: pp. 307 – 334, 341 – 350, 361, 376, 381, 382, 426</p>

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