



MathConnections Year 1 Correlation to the Georgia Performance Standards, Grade 9-12

MATHEMATICS 1

ALGEBRA

Students will explore functions and solve simple equations. Students will simplify and operate with radical, polynomial, and rational expressions.

Standard	Location/Page where Standard is found
MM1A1. Students will explore and interpret the characteristics of functions, using graphs, tables, and simple algebraic techniques.	
a. Represent functions using function notation.	Book 1b: 332 – 410 Book 3a: 14, 17, 25 – 28, 37 – 66, 108, 109
b. Graph the basic functions $f(x) = x^n$, where $n = 1$ to 3 , $f(x) = \sqrt{x}$, $f(x) = x $, and $f(x) = 1/x$.	Book 1a: 189, 190 Book 3a: 55 – 66, 83
c. Graph transformations of basic functions including vertical shifts, stretches, and shrinks, as well as reflections across the x - and y -axes.	Book 1a: 185 – 192 Book 3a: 30 – 35, 63 – 66, 175 – 186
d. Investigate and explain the characteristics of a function: domain, range, zeros, intercepts, intervals of increase and decrease, maximum and minimum values, and end behavior.	Book 1a: 199 Book 1b: 331 – 342, 346, 353, 369 – 371, 380, 385, 395 – 410 Book 3a: 8, 10, 13 – 15, 17 – 36, 43 – 54, 57, 63, 66, 165, 172, 174, 197 Book 3b: 458, 459
e. Relate to a given context the characteristics of a function, and use graphs and tables to investigate its behavior.	Book 1a: 179, 185 – 201 Book 1b: 340, 356 – 371, 375 – 398, 403 – 406, 409 Book 3a: 4 – 9, 13 – 19, 35 – 44, 47, 49, 50, 55, 56, 61, 62, 85 – 107, 127 – 130, 145 – 151, 187 – 195, 202-202

f. Recognize sequences as functions with domains that are whole numbers.	Book 1b: 346 – 362
g. Explore rates of change, comparing constant rates of change (i.e., slope) versus variable rates of change. Compare rates of change of linear, quadratic, square root, and other function families.	Book 1a: 173 – 179, 185, 186, 188, Book 1b: 388 – 398 Book 2a: 91 – 98, 200 – 206, Book 3a: 4, 17, 29, 53 – 56, 62, 66, 72, 85 – 107
h. Determine graphically and algebraically whether a function has symmetry and whether it is even, odd, or neither.	Not Presented
i. Understand that any equation in x can be interpreted as the equation $f(x) = g(x)$, and interpret the solutions of the equation as the x -value(s) of the intersection point(s) of the graphs of $y = f(x)$ and $y = g(x)$.	Book 1b: 288 – 306
MM1A2. Students will simplify and operate with radical expressions, polynomials, and rational expressions.	
a. Simplify algebraic and numeric expressions involving square root.	Book 3a: 83
b. Perform operations with square roots.	Book 3a: 83
c. Add, subtract, multiply, and divide polynomials.	Book 2a: 58 –65 Book 3a: 20, 21
d. Expand binomials using the Binomial Theorem.	Book 3a: 235
e. Add, subtract, multiply, and divide rational expressions.	Not Presented
f. Factor expressions by greatest common factor, grouping, trial and error, and special products limited to the formulas below. $(x + y)^2 = x^2 + 2xy + y^2$ $(x - y)^2 = x^2 - 2xy + y^2$ $(x + y)(x - y) = x^2 - y^2$ $(x + a)(x + b) = x^2 + (a + b)x + ab$ $(x + y)^3 = x^3 + 3x^2y + 3xy^2 + y^3$ $(x - y)^3 = x^3 - 3x^2y + 3xy^2 - y^3$	Not Presented

g. Use area and volume models for polynomial arithmetic.	Book 2a: 60 –65, 100 – 103 Book 3a: 37 – 39, 47
MM1A3. Students will solve simple equations.	
a. Solve quadratic equations in the form $ax^2 + bx + c = 0$, where $a = 1$, by using factorization and finding square roots where applicable.	Book 3a: 18 – 29
b. Solve equations involving radicals such as $\sqrt{x + b} = c$, using algebraic techniques.	Book 3a: 83
c. Use a variety of techniques, including technology, tables, and graphs to solve equations resulting from the investigation of $x^2 + bx + c = 0$.	Book 3a: 18 – 36
d. Solve simple rational equations that result in linear equations or quadratic equations with leading coefficient of 1.	Not presented

GEOMETRY

Students will explore, understand, and use the formal language of reasoning and justification. Students will apply properties of polygons and determine distances and points of concurrence.

Standard	Location/Page where Standard is found
MM1G1. Students will investigate properties of geometric figures in the coordinate plane.	
a. Determine the distance between two points.	Book 2a: 86 – 86 Book 2b: 441 – 447, 454, 461 – 467
b. Determine the distance between a point and a line.	Book 2b: 454
c. Determine the midpoint of a segment.	Not presented
d. Understand the distance formula as an application of the Pythagorean theorem.	Book 2a: 86 – 86 Book 2b: 441 – 447, 454, 461 – 467
e. Use the coordinate plane to investigate properties of and verify conjectures related to triangles and quadrilaterals.	Book 2a: 180 – 182, 187

MM1G2. Students will understand and use the language of mathematical argument and justification.	
a. Use conjecture, inductive reasoning, deductive reasoning, counterexamples, and indirect proof as appropriate.	Book 2a: 26, 31, 35, 40 – 42, 53, 68, 132, 157, 182, 183, 186, 189, 192, 193, 199, 228, 229, 237 – 239 Book 2b: 325 – 332, 348, 356 – 358, 373 – 378, 410 – 418 Book 3b: 392 – 394, 418 – 420, 454 – 457, 462, 545 – 600
b. Understand and use the relationships among a statement and its converse, inverse, and contrapositive.	Book 2a: 38 – 42 Book 2b: 301, 302, 308 Book 3b: 402 – 408, 413 – 416
MM1G3. Students will discover, prove, and apply properties of triangles, quadrilaterals, and other polygons.	
a. Determine the sum of interior and exterior angles in a polygon.	Book 2a: 92 – 199
b. Understand and use the triangle inequality, the side-angle inequality, and the exterior-angle inequality.	Book 2a: 77
c. Understand and use congruence postulates and theorems for triangles (SSS, SAS, ASA, AAS, HL).	Book 2a 167 – 189
d. Understand, use, and prove properties of and relationships among special quadrilaterals: parallelogram, rectangle, rhombus, square, trapezoid, and kite.	Book 2a: 32 – 41, 53
e. Find and use points of concurrency in triangles: incenter, orthocenter, circumcenter, and centroid.	Not Presented

DATA ANALYSIS AND PROBABILITY

Students will use counting techniques and determine probability. Students will demonstrate understanding of data analysis by posing questions to be answered by collecting data. Students will organize, represent, investigate, interpret, and make inferences from data.

Standard	Location/Page where Standard is found
MM1D1. Students will determine the number of outcomes related to a given event.	

a. Apply the addition and multiplication principles of counting.	Book 1b: 438 – 450 Book 3a: 210 - 218
b. Calculate and use simple permutations and combinations.	Book 3a: 210 - 235
MM1D2. Students will use the basic laws of probability.	
a. Find the probabilities of mutually exclusive events.	Book 1b: 468 – 467
b. Find the probabilities of dependent events.	Book 3a: 241 – 252
c. Calculate conditional probabilities.	Book 3a: 241 – 252
d. Use expected value to predict outcomes.	Book 3a: 263 – 270
MM1D3. Students will relate samples to a population.	
a. Compare summary statistics (mean, median, quartiles, and interquartile range) from one sample data distribution to another sample data distribution in describing center and variability of the data distributions.	Book 1a: 32 – 34, 39, 40, 44, 45, 50 – 60, 70 – 74
b. Compare the averages of the summary statistics from a large number of samples to the corresponding population parameters.	Book 3a: 283 – 295
c. Understand that a random sample is used to improve the chance of selecting a representative sample.	Book 1b: 477 – 492 Book 3a: 286 – 295
MM1D4. Students will explore variability of data by determining the mean absolute deviation (the average of the absolute values of the deviations).	

PROCESS STANDARDS

The following process standards are essential to mastering each of the mathematics content standards. They emphasize critical dimensions of the mathematical proficiency that all students need.

Standard	Location/Page where Standard is found
MM1P1. Students will solve problems (using appropriate technology).	
a. Build new mathematical knowledge through problem solving.	Book 1a: pp. 97, 121 – 123, 140, 144 Book 1b: pp. 276 – 278, 460 Book 2a: pp. 72, 224, 228 Book 2b: pp. 314 – 320, 324 – 332, 341 – 346, 352 – 356, 373 – 377, 390 – 392, 427, 428, 431 Book 3a: pp. 45, 46, 88, 104, 123, 205 – 209, 214 Book 3b: pp. 451, 454 – 457, 501 – 501
b. Solve problems that arise in mathematics and in other contexts.	Book 1a: pp. 49 – 52, 70 – 73, 78, 83 – 86, 93, 94, 129, 139, 151 – 157, 206 – 210, 213- 216, 222 – 226, 252 – 256, Book 1b: pp. 295, 296, 313 – 316, 319, 325, 326, 376, Book 2a: pp. 4 – 6, 14, 22, 94 – 98, 154 – 156, 166, 174 – 177, 187 – 189, 225, 235, 236 Book 2b: pp. 284 – 286, 293, 395, 398, 468 – 477, 509 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
c. Apply and adapt a variety of appropriate strategies to solve problems.	Book 1a: pp. 15, 123, 136, 138, 144, 184 – 191 Book 1b: pp. 276 – 278, 308 – 310, 320 – 321, 460 Book 2a: pp. 224, 228 Book 2b: pp. 314 – 320, 324 – 332, 341 – 346, 352 – 356, 373 – 377, 390 – 392, 427, 428, 431 Book 3a: pp. 109, 113 – 118, 148, 149, 163 – 179 Book 3b: pp. 454 – 457, 604
d. Monitor and reflect on the process of mathematical problem solving.	Book 1a: pp. 44, 97, 103, 124, 132, 173 Book 1b: pp. 460 Book 2a: pp. 77, 130, 144, 145, 182, 183, 189, 191 – 197, 201, 228, 229, 251 – 253 Book 2b: pp. 405, 417 Book 3a: pp. 13, 15, 24, 57, 58, 83, 91, 92, 108, 133, 215

	Book 3b: pp. 333
MM1P2. Students will reason and evaluate mathematical arguments.	
a. Recognize reasoning and proof as fundamental aspects of mathematics.	Book 1a: pp. 97, 103, 123, 177 Book 2a: pp. 26, 31, 35, 40 – 42, 53, 68, 132, 157, 182, 183, 186, 189, 192, 193, 199, 228, 229, 237 – 239 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
b. Make and investigate mathematical conjectures.	Book 1a: pp. 15, 123, 136, 138, 144, 184 – 191 Book 1b: pp. 276 – 278, 308 – 310, 320 – 321, 460 Book 2a: pp. 224, 228 Book 2b: pp. 314 – 320, 324 – 332, 341 – 346, 352 – 356, 373 – 377, 390 – 392, 427, 428, 431 Book 3a: pp. 109, 113 – 118, 148, 149, 163 – 179 Book 3b: pp. 454 – 457, 604
c. Develop and evaluate mathematical arguments and proofs.	Book 1a: pp. 97, 103, 123, 177 Book 2a: pp. 26, 31, 35, 40 – 42, 53, 68, 132, 157, 182, 183, 186, 189, 192, 193, 199, 228, 229, 237 – 239 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
d. Select and use various types of reasoning and methods of proof.	Book 1a: pp. 97, 103, 123, 177 Book 2a: pp. 26, 31, 35, 40 – 42, 53, 68, 132, 157, 182, 183, 186, 189, 192, 193, 199, 228, 229, 237 – 239 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

MM1P3. Students will communicate mathematically.	
a. Organize and consolidate their mathematical thinking through communication.	Book 1a: pp. 4, 17, 30, 63, 70 – 73, 137, 173, 219 – 221 Book 1b: pp. 276, 281, 283, 285, 286, 318, 347, 460 Book 2a: pp. 72, 228 Book 3a: pp. 26, 51 Book 3b: pp. 588 – 590
b. Communicate their mathematical thinking coherently and clearly to peers, teachers, and others.	Book 1a: pp. 4, 17, 30, 40, 44, 48, 61, 63, 70 – 73, 83, 101, 108, 126, 137, 167, 180, 207, 210, 245, 263, 264, 271 Book 1b: pp. 282, 295 – 297, 350, 410, 387, 400, 408 – 410, 460, 463, 466 Book 2a: pp. 72, 120, 126, 186, 204 Book 2b: pp. 284, 476 Book 3a: pp. 42, 96, 116, 117, 122, 135, 144, 261 Book 3b: pp. 388, 399, 490, 538, 550, 593, 602
c. Analyze and evaluate the mathematical thinking and strategies of others.	Book 1b: pp. 275 – 277
d. Use the language of mathematics to express mathematical ideas precisely.	Book 1a: pp. 4, 17, 30, 40, 44, 48, 61, 63, 70 – 73, 83, 101, 108, 126, 137, 167, 180, 207, 210, 245, 263, 264, 271 Book 1b: pp. 282, 295 – 297, 350, 410, 387, 400, 408 – 410, 460, 463, 466 Book 2a: pp. 72, 120, 126, 186, 204 Book 2b: pp. 284, 476 Book 3a: pp. 42, 96, 116, 117, 122, 135, 144, 261 Book 3b: pp. 388, 399, 490, 538, 550, 593, 602
MM1P4. Students will make connections among mathematical ideas and to other disciplines.	
a. Recognize and use connections among mathematical ideas.	Book 1a: pp. 128, 170 Book 1b: pp. 356, 357, 422 Book 2a: pp. 25, 55 – 65, 71, 72, 88, 100 – 103, 145, 149, 168, 169, 174, 175, 180 – 182, 216, 221 Book 2b: pp. 313 – 322, 373 – 377, 397 – 400, 404, 406 – 421, 442 –

	<p>476, 486 – 492 Book 3a: pp. 37 – 39 Book 3b: pp. 371 – 382, 454 – 457, 462, 472, 494, 500 – 504, 508, 522 – 523, 532</p>
<p>b. Understand how mathematical ideas interconnect and build on one another to produce a coherent whole.</p>	<p>Book 1a: pp. 128, 170 Book 1b: pp. 356, 357, 422 Book 2a: pp. 25, 55 – 65, 71, 72, 88, 100 – 103, 145, 149, 168, 169, 174, 175, 180 – 182, 216, 221 Book 2b: pp. 313 – 322, 373 – 377, 397 – 400, 404, 406 – 421, 442 – 476, 486 – 492 Book 3a: pp. 37 – 39 Book 3b: pp. 371 – 382, 454 – 457, 462, 472, 494, 500 – 504, 508, 522 – 523, 532</p>
<p>c. Recognize and apply mathematics in contexts outside of mathematics.</p>	<p>Book 1a: pp. 49 – 52, 70 – 73, 78, 83 – 86, 93, 94, 129, 139, 151 – 157, 206 – 210, 213- 216, 222 – 226, 252 – 256, Book 1b: pp. 295, 296, 313 – 316, 319, 325, 326, 376, Book 2a: pp. 4 – 6, 14, 22, 94 – 98, 154 – 156, 166, 174 – 177, 187 – 189, 225, 235, 236 Book 2b: pp. 284 – 286, 293, 395, 398, 468 – 477, 509 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</p>
<p>MM1P5. Students will represent mathematics in multiple ways.</p>	
<p>a. Create and use representations to organize, record, and communicate mathematical ideas.</p>	<p>Book 1a: pp. 8 – 11, 16 – 53, 60, 70 – 73, 176 – 210, 219 – 271 Book 1b: pp. 276 – 280, 288 – 328, 356 – 386, 424 – 450, 473, 476, 489 – 492 Book 2a: pp. 62 – 65, 72, 94, 101 – 102, 127, 136, 150, 180 – 182, 187, 271 – 280 Book 2b: pp. 309 – 314, 318, 319, 328, 438 – 467, 472 – 478, 494 – 499 Book 3a: pp. 37 – 38, 163 – 174 Book 3b: pp. 389 – 393, 494, 500 – 504, 432, 433, 458, 500 – 501, 589, 590</p>

<p>b. Select, apply, and translate among mathematical representations to solve problems.</p>	<p>Book 1a: pp. 14, 23, 87, 88, 172 – 173, 219 – 221 Book 1b: pp. 307 – 310, 320, 321, 350, 351, Book 2a: pp. 44, 69, 108, 221, 237 – 239 Book 2b: pp. 370 Book 3a: pp. 66 , 79, 81, 98, 106, 122, 237 Book 3b: pp. 334 – 338, 350, 361</p>
<p>c. Use representations to model and interpret physical, social, and mathematical phenomena.</p>	<p>Book 1a: pp. 49 – 52, 70 – 73, 78, 83 – 86, 93, 94, 129, 139, 151 – 157, 206 – 210, 213- 216, 222 – 226, 252 – 256, Book 1b: pp. 295, 296, 313 – 316, 319, 325, 326, 376, Book 2a: pp. 4 – 6, 14, 22, 94 – 98, 154 – 156, 166, 174 –177, 187 – 189, 225, 235, 236 Book 2b: pp. 284 – 286, 293, 395, 398, 468 – 477, 509 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</p>

READING STANDARD

Standard	Location/Page where Standard is found
S8CS10. Students will enhance reading in all curriculum areas by:	
<p>a. Reading in All Curriculum Areas</p> <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 discourse ∞ Read technical texts related to various subject areas. 	All sections, all texts
<p>b. 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. 	All sections, all texts

<ul style="list-style-type: none"> ∞ Recognize the features of disciplinary texts. 	
<p>c. 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 1a: p. 6, 34, 58, 64 – 65, 78, 85, 110 – 111 Book 1b: pp. 330 – 332, 347 – 348, 367 Book 2a: 9, 15,19, 24 – 25, 32, 36 – 38, 56, 91 – 95, 108, 113 –114, 157 – 161, 166 Book 2b: 283 – 292, 339- 340, 347, 352 – 353, 369, 379 – 380, 383 – 386, 398, 429 – 430 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>d. 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 1a: pp. 2, 4 – 11, 17, 26 – 32, 39 – 52, 70 – 73, 78, 79, 83 – 96, 102 – 104, 117 – 129, 139, 146, 151 – 161, 170 - 175, 193 – 194, 200 – 202, 206 – 210, 213 – 216, 219 – 245, 251 – 271 Book 1b: pp. 281 – 299, 307 – 319, 325, 326, 329 – 347, 353, 354, 360 – 378, 380 – 400, 403 – 410, 413 – 419, 424 – 429, 431, 432, 435, 436, 444 – 460, Book 2a: pp. 2, 16, 22, 43, 52, 135, 136, 153 – 156, 174, 175, 198, 199, 202, 207 – 210, 212, 217, 231, 252 Book 2b: pp. 283 – 286, 294, 305 – 307, 309 – 311, 323, 336, 338, 340 – 350, 355, 356, 375 – 381, 383, 390, 395, 396, 398, 407, 418, 421, 425 – 429, 435 – 437, 439, 445, 468 – 476, 482 – 485, 491, 491, 500, 501, 509 – 513, 520 – 525, 528 – 530, 532 – 535, 539 – 541 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>