



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

MATHEMATICS 2

NUMBER AND OPERATIONS

Students will use the complex number system.

Standard	Location/Page where Standard is found
MM2N1. Students will represent and operate with complex numbers.	
a. Write square roots of negative numbers in imaginary form.	Not presented
b. Write complex numbers in the form $a + bi$.	Not presented
c. Add, subtract, multiply, and divide complex numbers.	Not presented
d. Simplify expressions involving complex numbers.	Not presented

ALGEBRA

Students will investigate piecewise, exponential, and quadratic functions, using numerical, analytical, and graphical approaches, focusing on the use of these functions in problem-solving situations. Students will solve equations and inequalities and explore inverses of functions.

Standard	Location/Page where Standard is found
MM2A1. Students will investigate step and piecewise functions, including greatest integer and absolute value functions.	
a. Write absolute value functions as piecewise functions.	Book 3a: pp. 63 – 64
b. Investigate and explain characteristics of a variety of piecewise functions including domain, range, vertex, axis of symmetry, zeros, intercepts, extrema, points of discontinuity, intervals over which the function is constant, intervals of increase and decrease, and rates of change.	Book 1b: 364 – 371 Book 3a: pp. 66
c. Solve absolute value equations and inequalities analytically, graphically, and by using appropriate technology.	Book 3a: pp. 63 – 66
MM2A2. Students will explore exponential functions.	
a. Extend properties of exponents to include all integer exponents.	Book 1a: pp. 140 – 147 Book 3a: pp. 74 – 78
b. Investigate and explain characteristics of exponential functions, including domain and range, asymptotes, zeros, intercepts, intervals of increase and decrease, rates of change, and end behavior.	Book 3a: pp. 84 – 107
c. Graph functions as transformations of $f(x) = a^x$.	Book 3a: pp. 87 – 88
d. Solve simple exponential equations and inequalities analytically, graphically, and by using appropriate technology.	Book 3a: pp. 85 – 107, 119 – 126
e. Understand and use basic exponential functions as models of real phenomena.	Book 3a: pp. 92 – 93, 99 – 100, 106 – 107, 127 – 130
f. Understand and recognize geometric sequences as exponential functions with domains that are whole numbers.	Book 3b: pp. 511 – 524

g. Interpret the constant ratio in a geometric sequence as the base of the associated exponential function.	Book 3b: pp. 516 – 524
MM2A3. Students will analyze quadratic functions in the forms $f(x) = ax^2 + bx + c$ and $f(x) = a(x - h)^2 + k$.	
a. Convert between standard and vertex form.	Not presented
b. Graph quadratic functions as transformations of the function $f(x) = x^2$.	Book 3a: pp. 30 – 32
c. Investigate and explain characteristics of quadratic functions, including domain, range, vertex, axis of symmetry, zeros, intercepts, extrema, intervals of increase and decrease, and rates of change.	Book 3a: pp. 7, 10, 13, 15 – 29
d. Explore arithmetic series and various ways of computing their sums.	Book 3b: pp. 482 – 487
e. Explore sequences of partial sums of arithmetic series as examples of quadratic functions.	Not presented
MM2A4. Students will solve quadratic equations and inequalities in one variable.	
a. Solve equations graphically using appropriate technology.	Book 3a: pp. 7 – 9, 13 – 17, 25, 30 – 36
b. Find real and complex solutions of equations by factoring, taking square roots, and applying the quadratic formula.	Book 3a: pp. 18 – 25
c. Analyze the nature of roots using technology and using the discriminant.	Book 3a: pp. 22 – 25
d. Solve quadratic inequalities both graphically and algebraically, and describe the solutions using linear inequalities.	Not presented
MM2A5. Students will explore inverses of functions.	
a. Discuss the characteristics of functions and their inverses, including one-to-oneness, domain, and range.	Book 3a: pp. 48 – 54, 109-110, 114, 196 – 200

b. Determine inverses of linear, quadratic, and power functions and functions of the form $f(x) = a/x$, including the use of restricted domains.	Book 3a: pp. 48 – 54
c. Explore the graphs of functions and their inverses.	Book 3a: pp. 51 – 52, 109-110, 114, 196 – 200
d. Use composition to verify that functions are inverses of each other.	Book 3a: pp. 198

GEOMETRY

Students will explore right triangles and right-triangle trigonometry. They will understand and apply properties of circles and spheres, and use them in determining related measures.

Standard	Location/Page where Standard is found
MM2G1. Students will identify and use special right triangles.	
a. Determine the lengths of sides of 30°-60°-90° triangles.	Not presented
b. Determine the lengths of sides of 45°-45°-90° triangles.	Book 3a: pp. 278 – 280
MM2G2. Students will define and apply sine, cosine, and tangent ratios to right triangles.	
a. Discover the relationship of the trigonometric ratios for similar triangles.	Book 2a: pp. 221 – 222, 233 – 235, 244 – 246
b. Explain the relationship between the trigonometric ratios of complementary angles.	Book 2a: pp. 252
c. Solve application problems using the trigonometric ratios.	Book 2a: pp. 227, 229, 231, 241 – 242, 244 – 248, 251 – 253, 269 – 270 Book 2b: p. 312, 313, 346, 356, 381, 406 – 408
MM2G3. Students will understand the properties of circles.	
a. Understand and use properties of chords, tangents, and secants as an application of triangle similarity.	Book 2b: pp. 351
b. Understand and use properties of central, inscribed, and related angles.	Book 2b: pp. 352 – 359
c. Use the properties of circles to solve problems involving the length of an arc and the area of a sector.	Book 2b: pp. 339 – 350
d. Justify measurements and relationships in circles using geometric and algebraic properties.	Book 2b: pp. 228 – 291, 299 – 304, 308, 324 – 333, 351, 357 – 359

MM2G4. Students will find and compare the measures of spheres.

a. Use and apply surface area and volume of a sphere.

Book 2b: pp. 416 – 419, 421

b. Determine the effect on surface area and volume of changing the radius or diameter of a sphere.

Not presented

DATA ANALYSIS AND 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. They will use regression to analyze data and to make inferences.

Standard	Location/Page where Standard is found
MM2D1. Using sample data, students will make informal inferences about population means and standard deviations.	
a. Pose a question and collect sample data from at least two different populations.	Book 1a: pp. 4, 70 -73
b. Understand and calculate the means and standard deviations of sets of data.	Book 1a: pp. 14 – 18, 23, 31 – 39, 53 – 73
c. Use means and standard deviations to compare data sets.	Book 1a: pp. 32 – 34, 39, 50, 53, 59, 70 -73
d. Compare the means and standard deviations of random samples with the corresponding population parameters. Observe that the different sample means vary from one sample to the next. Observe that the distribution of the sample means has less variability than the population distribution.	Book 3a: pp. 279 - 284
MM2D2. Students will determine an algebraic model to quantify the association between two quantitative variables.	
a. Gather and plot data that can be modeled with linear and quadratic functions.	Book 2b: p. 328
b. Examine the issues of curve fitting by finding good linear fits to data using simple methods such as the median-median line and “eyeballing.”	Book 1a: pp. 243 - 250
c. Understand and apply the processes of linear and quadratic regression for curve fitting using appropriate technology.	Book 1a: pp. 251 – 257 Book 1b: pp. 307 – 310 Book 3a: 127 – 128

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
MM2P1. 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

<p>c. Apply and adapt a variety of appropriate strategies to solve problems.</p>	<p>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</p>
<p>d. Monitor and reflect on the process of mathematical problem solving.</p>	<p>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</p>
<p>MM2P2. Students will reason and evaluate mathematical arguments.</p>	
<p>a. Recognize reasoning and proof as fundamental aspects of mathematics.</p>	<p>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</p>
<p>b. Make and investigate mathematical conjectures.</p>	<p>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</p>

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
MM2P3. 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

<p>d. Use the language of mathematics to express mathematical ideas precisely.</p>	<p>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</p>
<p>MM2P4. Students will make connections among mathematical ideas and to other disciplines.</p>	
<p>a. Recognize and use connections among mathematical ideas.</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>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>MM2P5. 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>

c. Use representations to model and interpret physical, social, and mathematical phenomena.

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

READING STANDARD

Standard	Location/Page where Standard is found
S8CS10. Students will enhance reading in all curriculum areas by:	
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 discourse ∞ Read technical texts related to various subject areas. 	All sections, all texts
b. Discussing books <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. 	All sections, all texts
c. Building vocabulary knowledge <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. 	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>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</p> <p>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,</p> <p>Book 2a: pp. 2, 16, 22, 43, 52, 135, 136, 153 – 156, 174, 175, 198, 199, 202, 207 – 210, 212, 217, 231, 252</p> <p>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</p> <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</p> <p>Book 3b: pp. 307 – 334, 341 – 350, 361, 376, 381, 382, 426</p>
---	---