



MathMatters 2

An Integrated Program

Course 2 © 2006

STANDARDS		PAGE REFERENCES
Standard 1: Number and Operation		
Students in Grade 9 deepen their understanding of real numbers by applying properties of rational numbers and exponents and by identifying exact and approximate roots without simplification. Students use positive and negative numbers, absolute value, fractions, decimals, percentages, and scientific notation. Students use the proper order of operations and perform operations with rational numbers. Students apply number sense to everyday situations and judge reasonableness of answers.		
Goal 1.1: Understand and use numbers.		
Objective(s): By the end of Grade 9, the student will be able to:		
9.M.1.1.1	Apply properties of rational numbers. (347.01.b)	Student Edition: 52-55, 56-59, 66-69, 72-75, 76-79 <i>MathWorks</i> 61 Annotated Teacher's Edition: AA 59; CE 57; EL 57; LW 54; TT 53
9.M.1.1.2	Use positive and negative numbers, absolute value, fractions, decimals, percentages, and scientific notation, including application in real world situations. (347.01.a)	Student Edition: 63 Example 3, 69 #44, #46-#47, 77 Example 3, 78 #36-#37, 85 #35-#37, 125 #40, #50-#51, 135 #39-#40, #46 <i>MathWorks</i> 61, 81 Annotated Teacher's Edition: CE 63 Example 3

STANDARDS		PAGE REFERENCES
9.M.1.1.3	Apply properties of exponents. (347.01.c)	Student Edition: 82-85, 86-89 <i>Review</i> 96 #58-#73 Annotated Teacher's Edition: AA 84; CE 83, 87; LW 84, 88; TT 86, 90
9.M.1.1.4	Identify exact and approximate roots without simplification.	Student Edition: 136-139 <i>Are You Ready?</i> 103 #38-#45 <i>Assessment</i> 143 #27-#31 <i>Review</i> 142 Lesson 3-8 <i>Standardized Test Practice</i> 144 #9 <i>Think Back</i> 408 Annotated Teacher's Edition: CE 137; DI 136; EL 138; LW 138
9.M.1.1.5	Solve problems using number theory concepts (factors, multiples, primes). (347.01.d)	Student Edition: 404-407, 408-411 <i>Assessment</i> 415 #18-#20 <i>Review</i> 414 Lesson 9-8 Annotated Teacher's Edition: CE 405, 409; DI 411; EL 409; LW 406, 410; TT 405
9.M.1.1.6	Use appropriate vocabulary.	Student Edition: 52, 54 #22, 69 #45, 79 #46, 404, 406 #36 Annotated Teacher's Edition: V 52, 56, 82, 86
Goal 1.2: Perform computations accurately.		
Objective(s): By the end of Grade 9, the student will be able to:		
9.M.1.2.1	Use the order of operations and perform operations with rational numbers. (347.02.a)	Student Edition: 56-59, 67 Example 2, 68 #15-#35, 73 Example 3, 74 #16-#39 Annotated Teacher's Edition: AA 59; CE 57; EL 57; FG 58; LW 58; TT 56

STANDARDS		PAGE REFERENCES
Goal 1.3: Estimate and judge reasonableness of results.		
Objective(s): By the end of Grade 9, the student will be able to:		
9.M.1.3.1	Apply number sense to everyday situations and judge reasonableness of results. (347.03.a)	Student Edition: 54 #23, 69 #47, 93 #2, 106 Example 3, 135 #46, 247 #35, 260 Example 3, 508-509 <i>MathWorks</i> 113 <i>Problem Solving Tip</i> 123 <i>Standardized Test Practice</i> 145 #24
9.M.1.3.2	Identify that error accumulates in a computation when there is rounding. (349.05.b)	This standard can be discussed with the following examples. Student Edition: 136 #3, 139 #57, 508-509 <i>MathWorks</i> 81, 157, 385 Annotated Teacher's Edition: AA 88; CE 509; EL 107
Standard 2: Concepts and Principles of Measurement		
Students in Grade 9 formulate and use proportions, ratios, and scaling. Students apply concepts of rates and direct and indirect measurements. Students evaluate given measurement formulas for two- and three-dimensional objects.		
Goal 2.1: Understand and use U.S. customary and metric measurements.		
Objective(s): By the end of Grade 9, the student will be able to:		
9.M.2.1.1	Given the formulas, find the circumference, perimeter, or area of triangles, circles, and quadrilaterals, and the volume and surface area of rectangular prisms and cylinders. (349.01.a)	Student Edition: 226 #4, 427 Example 3, 429 #20-#22, #24-#26, 433, 456-459 <i>Are You Ready?</i> 148 Area, 420-421 Annotated Teacher's Edition: CE 148, 433 Example 1
9.M.2.1.2	Solve problems involving circumference, perimeter, or area of triangles, circles, and rectangles.	Student Edition: 152 Example 3, #5-#8, #12, 153 #16-#19, 429 #27, 433 <i>Review and Practice Your Skills</i> 156 #1-#4, 157 Annotated Teacher's Edition: CE 151 Example 2, 233

STANDARDS		PAGE REFERENCES
Goal 2.2: Apply the concepts of rates, ratios, and proportions.		
Objective(s): By the end of Grade 9, the student will be able to:		
9.M.2.2.1	Use rates, ratios, proportions, and map scales in problem-solving situations. (349.03.a)	<p>Student Edition: 106 Example 3, #9, 107 #25, #31, 122-125, 475 <i>Are You Ready?</i> 102-103 Ratios and Rates, 472-473 Equivalent Ratios <i>MathWorks</i> 113 #4-#5</p> <p>Annotated Teacher's Edition: CE 102 Ratios and Rates, 123; EL 107; TT 103, 122, 482</p>
9.M.2.2.2	Apply concepts of rates and direct and indirect measurements.	<p>Student Edition: 106 Example 3, #9, 478-481, 488 <i>MathWorks</i> 483</p> <p>Annotated Teacher's Edition: CE 479; DI 479; EL 481, 488; LW 480; TT 478</p>
9.M.2.2.3	Construct equivalent units, comparable units, and conversions. (349.02.a)	<p>Student Edition: 74 #54, 85 #37, 89 #66, 122, 125 #45-#47, 189 #1-#2 <i>MathWorks</i> 131 #4 <i>Standardized Test Practice</i> 145 #18</p> <p>Annotated Teacher's Edition: CE 105 Example 3; TT 105</p>
Goal 2.3: Apply dimensional analysis.		
Objective(s): By the end of Grade 9, the student will be able to:		
9.M.2.3.1	Use customary and metric units and their relationship to one another and to real world applications involving length, area, capacity, weight, time, and temperature. (349.04.a)	<p>Student Edition: 59 #43, 69 #47, 74 #54, 89 #66, 105, 229 #31, 427 Example 3 <i>MathWorks</i> 221, 253 <i>Standardized Test Practice</i> 145 #21</p> <p>Annotated Teacher's Edition: CE 105 Example 3; TT 105</p>

STANDARDS		PAGE REFERENCES
Goal 2.4: Apply appropriate techniques and tools to determine measurements.		
Objective(s): By the end of Grade 9, the student will be able to:		
9.M.2.4.1	Determine and use appropriate units. (349.01.a)	Student Edition: 75 #63, 129 #65, 218 #31, 257 #35-#37, 277 Example 2, 453 Example 3 <i>MathWorks</i> 221, 431 #33 <i>Standardized Test Practice</i> 145 #24 Annotated Teacher's Edition: FG 435
9.M.2.4.2	Approximate error in measurement situations.	Approximate error within measurements can be discussed with the following examples that use approximate measurement. Student Edition: 101 #2, #4, 107 #28-#31, 189 #1-#2 <i>MathWorks</i> 157 <i>Problem Solving Tip</i> 123 Annotated Teacher's Edition: AA 88; CE 123; EL 107
Standard 3: Concepts and Language of Algebra and Functions		
Students in Grade 9 use appropriate procedures for manipulating and simplifying algebraic expressions involving variables, integers, rational numbers, and for solving multi-step, first-degree equations and inequalities. Students understand the concept and applications of functions and mathematical models. Given graphs, charts, ordered pairs, mappings, or equations, students determine whether a relation is a function. Students evaluate functions written in functional notation and, given a function, students identify domain and range.		
Goal 3.1: Use algebraic symbolism as a tool to represent mathematical relationships.		
Objective(s): By the end of Grade 9, the student will be able to:		
9.M.3.1.1	Represent mathematical relationships using variables, expressions, linear equations and inequalities. (350.01.a)	Student Edition: 66-69, 72-75, 76-79, 254-257, 258-261 Annotated Teacher's Edition: CE 77, 255, 259; LW 68
Goal 3.2: Evaluate algebraic expressions.		
Objective(s): By the end of Grade 9, the student will be able to:		
9.M.3.2.1	Use appropriate procedures for manipulating and simplifying algebraic expressions involving variables, integers, and rational numbers. (350.02.a)	Student Edition: 66-68, 72-74, 76-78, 85 #38-#45, 88 #16-#23 Annotated Teacher's Edition: CE 67; TT 72, 81

STANDARDS		PAGE REFERENCES
Goal 3.3: Solve algebraic equations and inequalities.		
Objective(s): By the end of Grade 9, the student will be able to:		
9.M.3.3.1	Use appropriate procedures to solve multi-step, first-degree equations and inequalities; such as $3(2x - 5) = 5x + 7$ or $3(2x - 5) > 5x + 7$. (350.03.a)	Student Edition: 116-119, 132-135, 276-277 <i>Review</i> 141 Lesson 3-4 <i>Review and Practice Your Skills</i> 120 Lesson 3-4 Annotated Teacher's Edition: CE 117, 133, 277; DI 116; LW 134
9.M.3.3.2	Differentiate between linear and non-linear equations and graphs.	Student Edition: 264-267, 268 <i>Review and Practice Your Skills</i> 272 Lesson 6-5 Annotated Teacher's Edition: AA 264; CE 265; LW 266; TT 265
Goal 3.4: Solve simple linear systems of equations.		
Objective(s): By the end of Grade 9, the student will be able to:		
9.M.3.4.1	Use appropriate procedures to solve linear systems of equations involving two variables; such as $x + y = 7$ and $2x + 3y = 21$. (350.04.a)	Student Edition: 338-341, 344-347, 348-351 Annotated Teacher's Edition: CE 339, 345, 349; EL 346, 350; LW 340, 350
Goal 3.5: Understand the concept of functions.		
Objective(s): By the end of Grade 9, the student will be able to:		
9.M.3.5.1	Given graphs, charts, ordered pairs, mappings, or equations, determine whether a relation is a function.	Student Edition: 264-267, 274, 275 #5-#6 <i>Review</i> 287 Lesson 6-5 <i>Review and Practice Your Skills</i> 272 #5-#7 Annotated Teacher's Edition: CE 265; I 264; LW 266; TT 265, 280
9.M.3.5.2	Evaluate functions written in functional notation.	Student Edition: 265 Example 2, 267 #26 <i>MathWorks</i> 273 #4 Annotated Teacher's Edition: CE 2

STANDARDS		PAGE REFERENCES
9.M.3.5.3	Given a function, identify domain and range.	Student Edition: 264-265, 269 #1-#3 <i>MathWorks</i> 273 #3 <i>Review and Practice Your Skills</i> 272 #14-#19 Annotated Teacher's Edition: CE 265, 269
Goal 3.6: Apply functions to a variety of problems.		
Objective(s): By the end of Grade 9, the student will be able to:		
9.M.3.6.1	Model and solve real-world phenomena using multi-step, first degree, single variable equations and inequalities, linear equations, and two-variable linear systems of equations. (353.01.a)	Student Edition: 115 #8-#9, #13-#18, 119 #46-#47, 129 #39, 134 Example 4, 138 Example 4, 257 #34-#37 <i>MathWorks</i> 113, 131 Annotated Teacher's Edition: CE 133 Example 4
9.M.3.6.2	Use graphs and sequences to represent and solve problems. (347.02.b)	Student Edition: 114, 116 #3, 136, 254-256, 258-261, 264 Annotated Teacher's Edition: CE 115, 255, 259
Standard 4: Concepts and Principles of Geometry		
Students in Grade 9 represent linear relationships using tables, graphs, and mathematical symbols. Students interpret attributes of linear relationships such as slope, rate of change, and intercepts.		
Goal 4.1: Apply concepts of size, shape, and spatial relationships.		
Objective(s): By the end of Grade 9, the student will be able to:		
9.M.4.1.1	Recognize congruency and similarity of two-dimensional figures. (351.01.a)	Student Edition: 193 Example 2, 197, 206, 212-215, 474-477, 478-481 Annotated Teacher's Edition: CE 193 Example 2, 213; DI 212; EL 214
9.M.4.1.2	Recognize similarity as it relates to size variations in two-dimensional objects. (351.01.b)	Student Edition: 474-477, 478-481 <i>MathWorks</i> 483 Annotated Teacher's Edition: AA 474; CE 475, 479; EL 476, 480; LW 476, 480; TT 478

STANDARDS		PAGE REFERENCES
Goal 4.2: Apply the geometry of right triangles.		
Objective(s): By the end of Grade 9, the student will be able to:		
9.M.4.2.1	Given the Pythagorean Theorem, calculate a missing side length of a right triangle where the legs and hypotenuse are natural numbers. (351.02.c)	Student Edition: 484-487 <i>Review</i> 511 Lesson 11-3 <i>Review and Practice Your Skills</i> 492 #1-#7 Annotated Teacher's Edition: CE 485; DI 484; EL 487; LW 486
Goal 4.3: Apply graphing in two dimensions.		
Objective(s): By the end of Grade 9, the student will be able to:		
9.M.4.3.1	Identify attributes of the Cartesian Coordinate System, such as quadrants, origin, and axes. (351.03.a)	Student Edition: 244-247 <i>Are You Ready?</i> 242 The Coordinate Plane <i>MathWorks</i> 253 Annotated Teacher's Edition: CE 242, 245; EL 244; LW 246
9.M.4.3.2	Graph scatter plots and identify informal trend lines (e.g., eyeball fit lines).	Student Edition: 20-23, 27, 79 #55 <i>Standardized Test Practice</i> 145 #10-#12 Annotated Teacher's Edition: CE 21; EL 21; LW 22; TT 144
9.M.4.3.3	Identify positive and negative correlations.	Student Edition: 21, 23 #8, #11, 27 #1-#3 Annotated Teacher's Edition: CE 21, 27
Goal 4.4: Represent and graph linear relationships.		
Objective(s): By the end of Grade 9, the student will be able to:		
9.M.4.4.1	Create graphs and equations for linear relationships.	Student Edition: 254-257, 258-261, 264-265, 275 #7, 278 #18 Annotated Teacher's Edition: CE 255, 259, 262, 265
9.M.4.4.2	Represent linear relationships using tables, graphs, and mathematical symbols.	Student Edition: 114, 116 #3, 136, 254-256, 258-261, 264 Annotated Teacher's Edition: CE 115, 255, 259

STANDARDS		PAGE REFERENCES
9.M.4.4.3	Interpret attributes of linear relationships such as slope, rate of change, and intercepts.	Student Edition: 248-251, 254 Example 1 <i>MathWorks</i> 253 #3-#4 <i>Review and Practice Your Skills</i> 252 #26-#37 Annotated Teacher's Edition: CE 249, 252 Lesson 6-2; LW 250, 256; TT 248
Standard 5: Data Analysis, Probability, and Statistics		
Students in Grade 9 interpret and use basic statistical concepts including mean, median, mode, range, and distribution of data, including outliers. Students make predictions and draw conclusions based on statistical measures and students make predictions based on randomness, chance, equally likely events, and probability. Students find probabilities based on dependent, independent, and compound events and students make predictions based on randomness, chance, equally likely events, and probability.		
Goal 5.1: Represent data with a variety of formats.		
Objective(s): By the end of Grade 9, the student will be able to:		
9.M.5.1.1	Analyze and interpret tables, charts, and graphs, including scatter plots, broken line graphs, and box-and-whisker plots. (352.01.a)	Student Edition: 3, 16-19, 20-23 <i>Are You Ready?</i> 5 #13-#16 <i>Assessment</i> 45 #3-#5, #11-#12 <i>Standardized Test Practice</i> 47 #9-#14 Annotated Teacher's Edition: CE 17, 21; EL 5
Goal 5.2: Collect, organize, and display data.		
Objective(s): By the end of Grade 9, the student will be able to:		
9.M.5.2.1	Collect, organize, and display data in tables, charts, and graphs. (352.02.a)	Student Edition: 6-9, 22 #6, 31 #14 Annotated Teacher's Edition: CE 7, 14; LW 8
Goal 5.3: Apply simple statistical measurements.		
Objective(s): By the end of Grade 9, the student will be able to:		
9.M.5.3.1	Interpret and use basic statistical concepts, including mean, median, mode, range, and distribution of data, including outliers. (352.03.a)	Student Edition: 10-13, 28-31 <i>MathWorks</i> 15 Annotated Teacher's Edition: AA 10; CE 11, 15; EL 11; LW 12

STANDARDS		PAGE REFERENCES
9.M.5.3.2	Make predictions and draw conclusions based on statistical measures. (352.05.a)	Student Edition: 150-155, 158-161, 162-165 <i>MathWorks</i> 177 <i>Review and Practice Your Skills</i> 176 #1-#18 Annotated Teacher's Edition: CE 163, 176
Goal 5.4: Understand basic concepts of probability.		
Objective(s): By the end of Grade 9, the student will be able to:		
9.M.5.4.1	Find probabilities based on dependent, independent, and compound events.	Student Edition: 168-171 <i>Review</i> 184 Lesson 4-5 <i>Review and Practice Your Skills</i> 176 #1-#18 Annotated Teacher's Edition: CE 169; EL 169; LW 170
9.M.5.4.2	Contrast experimental and theoretical probability. (352.04.a)	Student Edition: 150-153, 158-161 Annotated Teacher's Edition: CE 151, 159; I 158; LW 152, 160; TT 158, 161
Goal 5.5: Make predictions or decisions based on data.		
Objective(s): By the end of Grade 9, the student will be able to:		
9.M.5.5.1	Make predictions based on randomness, chance, equally likely events, and probability. (352.04.c)	Student Edition: 22 #6, 23 #7, 26, 27 #7-#10, 82 #4 <i>Review and Practice Your Skills</i> 32 #1-#2 Annotated Teacher's Edition: EL 21
9.M.5.5.2	Use appropriate tools/technology to conduct simulations and employ graphical models to make predictions or decisions based on data. (352.05.a)	Student Edition: 154-155 <i>Review and Practice Your Skills</i> 156 Lesson 4-2 Annotated Teacher's Edition: CE 155
9.M.5.5.3	Design, conduct, and interpret results of statistical experiments. (352.05.b)	Student Edition: 150-153, 154-155 <i>Review and Practice Your Skills</i> 156 Lesson 4-2 Annotated Teacher's Edition: CE 151, 155; LW 152