



MathMatters 3

An Integrated Program

Course 3 © 2006

STANDARDS		PAGE REFERENCES
<u>Standard 1: Number and Operation</u>		
Students in Grade 10 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 10, the student will be able to:		
10.M.1.1.1	Apply properties of rational numbers. (347.01.b)	Student Edition: 10, 20-23, 26-29, 30-31 <i>Are You Ready?</i> 243 #32-#39 Review 42 Lesson 1-2, 43 Lesson 1-4 – Lesson 1-5 Annotated Teacher's Edition: CE 21, 27; LW 28
10.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: 21 Example 3, 22 #8-#10, 28 #31, 29 #38 MathWorks 15, 33, 253, 435 Annotated Teacher's Edition: EL 29, 33

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10.M.1.1.3	Apply properties of exponents. (347.01.c)	Student Edition: 34-37, 38-41 <i>Are You Ready?</i> 466 #11-#22 Annotated Teacher's Edition: AA 40; CE 35, 39; EL 41; FG 35; LW 36
10.M.1.1.4	Identify exact and approximate roots without simplification.	Student Edition: 426-429, 541 Example 2 <i>Are You Ready?</i> 425 #20, #22, #24, #26, #28, #30 Annotated Teacher's Edition: 5MW 430; CE 427; EL 429; LW 428; PE 426; TT 427
10.M.1.1.5	Solve problems using number theory concepts (factors, multiples, primes). (347.01.d)	Student Edition: 472-475, 478-481 <i>Are You Ready?</i> 467 #23-#34 <i>Review and Practice Your Skills</i> 477 Annotated Teacher's Edition: AA 475; CE 473, 479; EL 479; LW 474; PE 473
10.M.1.1.6	Use appropriate vocabulary.	Student Edition: 10, 16, 26, 34, 75 #34, 482, 483 Annotated Teacher's Edition: AA 40, 475; FG 16
Goal 1.2: Perform computations accurately.		
Objective(s): By the end of Grade 10, the student will be able to:		
10.M.1.2.1	Use the order of operations and perform operations with rational numbers. (347.02.a)	Student Edition: 20-23, 26-29, 30-31, 34-37, 468-471, 472-475 <i>Are You Ready?</i> 466 Order of Operations <i>MathWorks</i> 33 Annotated Teacher's Edition: 5MW 34; CE 27, 31; EL 36

STANDARDS		PAGE REFERENCES
Goal 1.3: Estimate and judge reasonableness of results.		
Objective(s): By the end of Grade 10, the student will be able to:		
10.M.1.3.1	Apply number sense to everyday situations and judge reasonableness of results. (347.03.a)	Student Edition: 8 Example 4, 21 Example 3, 22 #9, 204 Example 5, 205 #32, 282-283 Example 1 <i>Are You Ready?</i> 5 <i>MathWorks</i> 35 <i>Review and Practice Your Skills</i> 24 #31-#33 Annotated Teacher's Edition: EL 23, 29
10.M.1.3.2	Identify that error accumulates in a computation when there is rounding. (349.05.b)	Student Edition: 22 #11, 204 #10, 205 #31, 208 #17, 361 #32, 583 #37-#40 Annotated Teacher's Edition: EL 21, 22
Standard 2: Concepts and Principles of Measurement		
Students in Grade 10, given relative formulas, determine length, distance, area, surface area, capacity, and weight, with appropriate unit labels. Students 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 10, the student will be able to:		
10.M.2.1.1	Given the formulas, find the circumference, perimeter, or area of triangles, circles, and quadrilaterals, the volume of spheres, non-oblique prisms, cylinders, and cones, and the surface area of spheres, non-oblique prisms, cylinders, and right square-based pyramids. (349.01.a)	Student Edition: 206-209, 224-227, 230-233 <i>Are You Ready?</i> 200-201 #1-#9 <i>MathWorks</i> 211 Annotated Teacher's Edition: AA 232; CE 207, 213, 225, 231
10.M.2.1.2	Solve problems involving circumference, perimeter, or area of triangles, circles, and rectangles.	Student Edition: 207 Example 2, 208 #14-#15, 209 #19-#21, 213, 214 #16, 215 #17, 216-217, 224-225, 226 #10 <i>MathWorks</i> 211 Annotated Teacher's Edition: CE 207, 217; EL 207

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Goal 2.2: Apply the concepts of rates, ratios, and proportions.		
Objective(s): By the end of Grade 10, the student will be able to:		
10.M.2.2.1	Use rates, ratios, proportions, map scales, and scale factors (one- and two-dimensional) in problem-solving situations. (349.03.a)	Student Edition: 202 Example 1, 205 #28-#34, 293, 297, 298 #7-#8, #18-#21, 299 #28-#30, #33-#34, 306-309, 312 #7 <i>MathWorks</i> 305, 325 Annotated Teacher's Edition: AA 203; CE 203 Example 5; EL 205, 299; LW 204
10.M.2.2.2	Apply concepts of rates and direct and indirect measurements.	Student Edition: 202-205, 326-327 <i>MathWorks</i> 305 Annotated Teacher's Edition: CE 203, 327; EL 202, 205, 326; LW 204, 327
10.M.2.2.3	Construct equivalent units, comparable units, and conversions. (349.02.a)	Student Edition: 39, 203-205 <i>MathWorks</i> 211 <i>Mental Math Tip</i> 203 <i>Review and Practice Your Skills</i> 210 #1-#17 Annotated Teacher's Edition: CE 203; EL 202, 204, 205
Goal 2.3: Apply dimensional analysis.		
Objective(s): By the end of Grade 10, the student will be able to:		
10.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)	Student Edition: 203, 204-205 Example 5, #9, #19-#22, #26-#34 Annotated Teacher's Edition: AA 203; CE 203; EL 202, 204, 205
Goal 2.4: Apply appropriate techniques and tools to determine measurements.		
Objective(s): By the end of Grade 10, the student will be able to:		
10.M.2.4.1	Determine and use appropriate units. (349.01.a)	Student Edition: 204-205 #10, #19-#22, #32 <i>Review and Practice Your Skills</i> 210 #13-#15 Annotated Teacher's Edition: EL 205

STANDARDS		PAGE REFERENCES
10.M.2.4.2	Approximate error in measurement situations.	Student Edition: 175 #30, 202, 205 #30, 208 #17, 582 #15 <i>Assessment</i> 237 #18-#19 <i>Review</i> 234 #13
Standard 3: Concepts and Language of Algebra and Functions		
Students in Grade 10 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 10, the student will be able to:		
10.M.3.1.1	Represent mathematical relationships using variables, expressions, linear equations and inequalities. (350.01.a)	Student Edition: 59 #21-#22, 62-65, 68 #10-#13, 69 #25-#28, #38, 74 Example 4, 79 #25-#26 <i>MathWorks</i> 61 Annotated Teacher's Edition: CE 57, 63; FG 77; LW 64, 74 #2
Goal 3.2: Evaluate algebraic expressions.		
Objective(s): By the end of Grade 10, the student will be able to:		
10.M.3.2.1	Use appropriate procedures for manipulating and simplifying algebraic expressions involving variables, integers, and rational numbers. (350.02.a)	Student Edition: 36 Example 3, #8-#15, #27-#34, 64 #1-#2, 73-75, 470 #1-#6, #9-#12, #15-#28, 472 Example 1, 473 Example 3 Annotated Teacher's Edition: CE 73, 473; FG 72; LW 74; PE 471
Goal 3.3: Solve algebraic equations and inequalities.		
Objective(s): By the end of Grade 10, the student will be able to:		
10.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: 59 #21-#22, 63 Example 3-Example 4, 64 #3-#4, 65 #10-#11, #15-#16, 66-69, 72-75, 76-79 <i>Review and Practice Your Skills</i> 70 #19-#51 Annotated Teacher's Edition: CE 57 Example 4, 67, 73

STANDARDS		PAGE REFERENCES
10.M.3.3.2	Differentiate between linear and non-linear equations and graphs.	Student Edition: 59 #31-#33, 62, 520 <i>Are You Ready?</i> 518 <i>Review 95 Lesson 2-3</i> Annotated Teacher's Edition: AA 65; LW 64 #3; TT 520
Goal 3.4: Solve simple linear systems of equations.		
Objective(s): By the end of Grade 10, the student will be able to:		
10.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: 258-261, 264-267, 268-271, 274-275, 276-279, 282-285 <i>MathWorks</i> 273 <i>Review and Practice Your Skills</i> 262 Lesson 6-4 Annotated Teacher's Edition: CE 259, 265, 269; EL 259
Goal 3.5: Understand the concept of functions.		
Objective(s): By the end of Grade 10, the student will be able to:		
10.M.3.5.1	Given graphs, charts, ordered pairs, mappings, or equations, determine whether a relation is a function.	Student Edition: 56-59 <i>Are You Ready?</i> 518 Graphs of Functions <i>MathWorks</i> 61 <i>Review and Practice Your Skills</i> 60 #34-#35 Annotated Teacher's Edition: AA 59; CE 57 Example 1-Example 2, EL 58, LW 64
10.M.3.5.2	Evaluate functions written in functional notation.	Student Edition: 58 Example 3, #5-#8, #15-#17, 59 #23-#30, 63, 64 #3-#4, 65 #10-#11, #15-#16 <i>Review and Practice Your Skills</i> 60 #26-#33, 61 #44-#47 Annotated Teacher's Edition: CE 63 Example 4
10.M.3.5.3	Given a function, identify domain and range.	Student Edition: 56-59, 63 Example 2 <i>Assessment</i> 97 #2 Annotated Teacher's Edition: AA 59; CE 57 Example 1, 61 Lesson 2-2, 63 Example 2; LW 58

STANDARDS		PAGE REFERENCES
Goal 3.6: Apply functions to a variety of problems.		
Objective(s): By the end of Grade 10, the student will be able to:		
10.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: 64 #5, 68 #14, 74 Example 4, #9, 75 #33, 79 #25-#26, 261 #13-#15 <i>MathWorks</i> 81 Annotated Teacher's Edition: CE 259 Example 4; DI 67
10.M.3.6.2	Use graphs and sequences to represent and solve problems. (347.02.b)	Student Edition: 52-53, 76, 77, 78 Example 2-Example 3 Annotated Teacher's Edition: CE 53, 77; DI 55; EL 53, 54
Standard 4: Concepts and Principles of Geometry		
<p>Students in Grade 10 recognize congruency and similarity of two-dimensional figures. Students identify and use similarity as it relates to size variations in two- and three-dimensional objects. Given the Pythagorean Theorem, students calculate missing side lengths of right triangles without simplifying radicals. Students represent linear relationships using tables, graphs, and mathematical symbols. Students interpret attributes of linear relationships such as slope, rate of change, and intercepts. Students use logic to make and evaluate mathematical arguments.</p>		
Goal 4.1: Apply concepts of size, shape, and spatial relationships.		
Objective(s): By the end of Grade 10, the student will be able to:		
10.M.4.1.1	Recognize and apply congruency and similarity of two-dimensional figures. (351.01.a)	Student Edition: 300-303, 306-309, 310-313, 316-319, 326-327 <i>Are You Ready?</i> 294-295 Congruent Triangles Annotated Teacher's Edition: CE 295, 301, 327; EL 303, 307; FG 302; TT 301
10.M.4.1.2	Recognize and use similarity as it relates to size variations in two- and three-dimensional objects. (351.01.b)	Student Edition: 300-303, 306-309, 310-313, 326-327 Annotated Teacher's Edition: CE 301, 327; EL 307; FG 302

STANDARDS		PAGE REFERENCES
Goal 4.2: Apply the geometry of right triangles.		
Objective(s): By the end of Grade 10, the student will be able to:		
10.M.4.2.1	Given the Pythagorean Theorem, calculate missing side lengths of right triangles without simplifying radicals. (351.02.c)	<p>Student Edition: 430-433, 544-547 <i>Are You Ready?</i> 519 Pythagorean Theorem <i>MathWorks</i> 435 <i>Review and Practice Your Skills</i> 434 Lesson 10-2</p> <p>Annotated Teacher's Edition: CE 431, 519 Pythagorean Theorem; DI 431; EL 433; FG 432; LW 432, 546; TT 430</p>
Goal 4.3: Apply graphing in two dimensions.		
Objective(s): By the end of Grade 10, the student will be able to:		
10.M.4.3.1	Identify attributes of the Cartesian Coordinate System, such as quadrants, origin, and axes. (351.03.a)	<p>Student Edition: 56-59 <i>MathWorks</i> 61 #2 <i>Review</i> 94 Lesson 2-2 <i>Review and Practice Your Skills</i> 60 #18-#25</p> <p>Annotated Teacher's Edition: DI 57</p>
10.M.4.3.2	Graph scatter plots and identify informal trend lines (e.g., eyeball fit lines).	<p>Student Edition: 406, 407 Example 2, 408 #1-#3, 409 #13 <i>Assessment</i> 419 #7-#8 <i>Review</i> 418 #33-#34 <i>Review and Practice Your Skills</i> 410 #25-#26</p> <p>Annotated Teacher's Edition: AA 409; CE 407 Example 1-Example 2; FG 408; LW 408 #1</p>
10.M.4.3.3	Identify positive and negative correlations.	<p>Student Edition: 406 <i>Assessment</i> 419 #7 <i>Review</i> 418 #33-#34 <i>Review and Practice Your Skills</i> 410 #27</p> <p>Annotated Teacher's Edition: AA 411; EL 406</p>

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Goal 4.4: Represent and graph linear relationships.		
Objective(s): By the end of Grade 10, the student will be able to:		
10.M.4.4.1	Create graphs and equations for linear relationships.	Student Edition: 62-65, 76-79, 244-247, 248, 254-257 <i>Are You Ready?</i> 242 Graphing Linear Equations Annotated Teacher's Edition: CE 63, 77, 255
10.M.4.4.2	Represent linear relationships using tables, graphs, and mathematical symbols.	Student Edition: 62-65, 76-79, 244-247, 248 <i>Are You Ready?</i> 242 Graphing Linear Equations Annotated Teacher's Edition: CE 77; FG 256
10.M.4.4.3	Interpret attributes of linear relationships such as slope, rate of change, and intercepts.	Student Edition: 244-247, 258 <i>MathWorks</i> 253 Annotated Teacher's Edition: AA 244; CE 245, 259; EL 245; LW 246, 260; TT 254
Goal 4.5: Use reasoning skills.		
Objective(s): By the end of Grade 10, the student will be able to:		
10.M.4.5.1	Use logic to make and evaluate mathematical arguments. (348.02.b)	Student Edition: 134-137, 138-139, 143 <i>Are You Ready?</i> 103 Logical Reasoning <i>Assessment</i> 143 #15-#16 Annotated Teacher's Edition: AA 103; CE 103 Logical Reasoning, 139

STANDARDS		PAGE REFERENCES
Standard 5: Data Analysis, Probability, and Statistics		
Students in Grade 10 read, interpret, and use tables, charts, and graphs, including scatter plots, multiple broken line graphs, and box-and-whisker plots. Students 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 10, 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: 86-87 Example 1-Example 2, 88 #12, 89 #13-#18, 92-93, 406-407 Example 1-Example 2 Annotated Teacher's Edition: CE 87 Example 2-Example 3, 407 Example 1-Example 2; GS 92; LW 88 #2
Goal 5.2: Collect, organize, and display data.		
Objective(s): By the end of Grade 10, the student will be able to:		
10.M.5.2.1	Collect, organize, and display data in tables, charts, and graphs. (352.02.a)	Student Edition: 84 #1, #4, #6, 85 #8, 86-87, 88 #1, #7, 407 Example 3 Annotated Teacher's Edition: CE 3, 87, 407 Example 2, Example 4; LW 84
Goal 5.3: Apply simple statistical measurements.		
Objective(s): By the end of Grade 10, the student will be able to:		
10.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: 82-85 <i>Are You Ready?</i> 51 Measures of Central Tendency Annotated Teacher's Edition: CE 51 Measures of Central Tendency, 83; DI 82; EL 83; LW 84; TT 51
10.M.5.3.2	Make predictions and draw conclusions based on statistical measures. (352.05.a)	Student Edition: 86-89, 92-83, 406-407, 408 #1-#3 Annotated Teacher's Edition: AA 409; CE 407; EL 93, 406; FG 408; I 406; LW 408

STANDARDS		PAGE REFERENCES
Goal 5.4: Understand basic concepts of probability.		
Objective(s): By the end of Grade 10, the student will be able to:		
10.M.5.4.1	Find probabilities based on dependent, independent, and compound events.	Student Edition: 384, 386-387, 396-399 <i>Review and Practice Your Skills</i> 400 Annotated Teacher's Edition: EL 386, 399, 401; FG 398, 400; TT 396
10.M.5.4.2	Contrast experimental and theoretical probability. (352.04.a)	Student Edition: 384, 386 #5-#8, 387 #21-#24 <i>Review and Practice Your Skills</i> 400 #10-#27 Annotated Teacher's Edition: I 384; LW 386 #2
Goal 5.5: Make predictions or decisions based on data.		
Objective(s): By the end of Grade 10, the student will be able to:		
10.M.5.5.1	Make predictions based on randomness, chance, equally likely events, and probability. (352.04.c)	Student Edition: 384, 386-387, 396-399 <i>Review and Practice Your Skills</i> 400 Annotated Teacher's Edition: EL 386, 399, 401; FG 398, 400; TT 396
10.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: 388-289 <i>MathWorks</i> 391 <i>Review and Practice Your Skills</i> 390 Lesson 9-2 Annotated Teacher's Edition: CE 389; TT 388, 389
10.M.5.5.3	Design, conduct, and interpret results of statistical experiments. (352.05.b)	Student Edition: 384 #1-#2, 386 #5-#7, 387 #21, #24 Annotated Teacher's Edition: EL 386; I 384