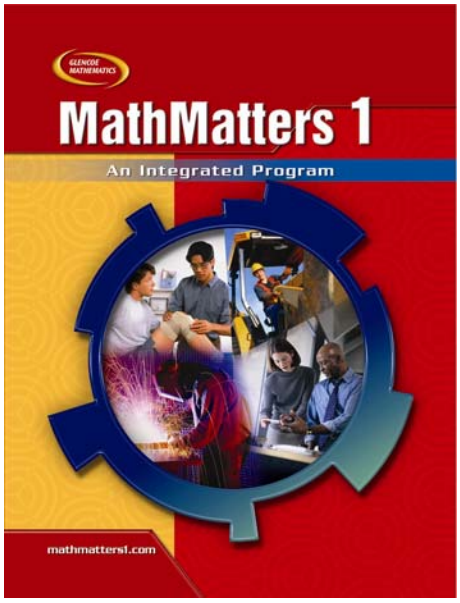
Mc Graw Hill Glencoe

Mathematics
Benchmarks and Indicators
Grade Nine

Ohio



MathMatters 1

An Integrated Program

STANDARDS	PAGE REFERENCES
Number, Number Sense and Operations Standard	
Number and Number Systems	
1. Identify and justify whether properties (closure, identity, inverse, commutative and associative) hold for a given set and operations; e.g., even integers and multiplication.	**Student Edition:** 118-121, 122 #38-#59, 123 #82-#87, 131 #52-#54, 141 #84-#86, 147 #35-#37, 149 #27-#30, 206 #7-#12 **Annotated Teacher Edition:** CE 119; DI 118; QA 120
2. Compare, order, and determine equivalent forms for rational and irrational numbers.	**Student Edition:** 101 #4, 103 #19-#30, 112 #60-#65, 119 #2, 206 #15-#20, 240 #1-#2, 536 #7-#12 **Annotated Teacher Edition:** GS 104; I 118; TT 207
Meaning of Operations	
3. Explain the effects of operations such as multiplication or division, and of computing powers and roots on the magnitude of quantities.	**Student Edition:** 108-111, 112 #36-#65, 132-135 **Annotated Teacher Edition:** ETL 109, 137; GS 142; QA 110, 144; TT 108, 134

Codes used for Annotated Teacher Edition pages are the initial caps of headings on that page.

STANDARDS	PAGE REFERENCES
Computation and Estimation	
4. Demonstrate fluency in computations using real numbers.	**Student Edition:** 104-107, 108-111, 112 #1-#24, 113 #67-#84, 114-117, 122 #1-#27, 123 #60-#77, 146 #11-#22 **Annotated Teacher Edition:** GS 108, 114
5. Estimate the solutions for problem situations involving square and cube roots.	**Student Edition:** 142-145 **Annotated Teacher Edition:** CE 143; QA 144; TT 142
Measurement Standard	
Measurement Units	
1. Convert rates within the same measurement system; e.g., miles per hour to feet per second; kilometers per hour to meters per second.	**Student Edition:** 56-59, 60 #23-#37, 61 #63-#68, 71 #39-#44, 79 #44-#46, 89 #59-#64 **Annotated Teacher Edition:** CE 57; DI 56; ETL 57; GS 56; QA 58
Use Measurement Techniques and Tools	
2. Use unit analysis to check computations involving measurement.	**Student Edition:** 50 #7-#14
3. Use the ratio of lengths in similar two-dimensional figures or three-dimensional objects to calculate the ratio of their areas or volumes respectively.	**Student Edition:** 77 #64
4. Use scale drawings and right triangle trigonometry to solve problems that include unknown distances and angle measures.	**Student Edition:** 84-87, 88 #46-#54, 89 #97-#99, 96 #55, 97 #34 **Annotated Teacher Edition:** CE 85
5. Solve problems involving unit conversion for situations involving distances, areas, volumes and rates within the same measurement system.	**Student Edition:** 50 #7-#14, 56-59, 60 #46-#54, 61 #69-#75, 69 #42-#47, 71 #39-#44, 77 #65-#74, 79 #44-#46 **Annotated Teacher Edition:** DI 58; QA 58

STANDARDS	PAGE REFERENCES
Geometry and Spatial Sense Standard	
Characteristics and Properties	
1. Define the basic trigonometric ratios in right triangles: sine, cosine and tangent.	This standard can be met in Glencoe's *MathMatters 2* © 2009 on pages 488-491.
2. Apply proportions and right triangle trigonometric ratios to solve problems involving missing lengths and angle measures in similar figures.	This standard can be met in Glencoe's *MathMatters 2* © 2009 on pages 474-477 and 488-491.
Visualization and Geometric Models	
3. Analyze two-dimensional figures in a coordinate plane; e.g., use slope and distance formulas to show that a quadrilateral is a parallelogram.	**Student Edition:** 3-4 #1-#16, 308-311, 312 #11-#40, 313 #45-#59, 323 #55-#58, 333 #36-#38, 342 #16-#20, 345 #3-#7, 346 #7, 347 #17 **Annotated Teacher Edition:** CE 305; DI 308; QA 310
Patterns, Functions and Algebra Standard	
Use Patterns, Relations and Functions	
1. Define function with ordered pairs in which each domain element is assigned exactly one range element.	**Student Edition:** 314-317, 322 #1-#27, 323 #59-#62, 333 #39-#42, 343 #21-#23 **Annotated Teacher Edition:** AA 317; CE 315; FG 315; QA 316; TT 314
2. Generalize patterns using functions or relationships (linear, quadratic and exponential), and freely translate among tabular, graphical and symbolic representations.	**Student Edition:** 124-127, 130 #1-#8, 147 #38-#40, 149 #33, 150 #10, 258 #17-#26, 264 ex 1, 265 ex 2 – ex 3 **Annotated Teacher Edition:** ETL 125; QA 126; TT 264
3. Describe problem situations (linear, quadratic and exponential) by using tabular, graphical and symbolic representations.	**Student Edition:** 124-127, 130 #1-#8, 147 #38-#40, 149 #33, 150 #10, 258 #17-#26, 264 ex 1, 265 ex 2 – ex 3 **Annotated Teacher Edition:** ETL 125; QA 126; TT 264
4. Demonstrate the relationship among zeros of a function, roots of equations, and solutions of equations graphically and in words.	**Student Edition:** 319, 338-341 **Annotated Teacher Edition:** CE 339

STANDARDS	PAGE REFERENCES
5. Describe and compare characteristics of the following families of functions: linear, quadratic and exponential functions; e.g., general shape, number of roots, domain, range, rate of change, maximum or minimum.	**Student Edition:** 314, 315 ex 3, 316 #7-#8 **Annotated Teacher Edition:** ETL 341; TT 314
Use Algebraic Representations	
6. Write and use equivalent forms of equations and inequalities in problem situations; e.g., changing a linear equation to the slope-intercept form.	**Student Edition:** 321 #44-#45, 328-331, 332 #30-#33 **Annotated Teacher Edition:** CE 329; QA 330
7. Use formulas to solve problems involving exponential growth and decay.	**Student Edition:** 135 #73
8. Find linear equations that represent lines that pass through a given set of ordered pairs, and find linear equations that represent lines parallel or perpendicular to a given line through a specific point.	**Student Edition:** 329 ex 2, 330 #22-#24, 331 #31, 332 #30-#33, 344 #33, 345 #22-#23 **Annotated Teacher Edition:** CE 329
9. Solve and interpret the meaning of 2 by 2 systems of linear equations graphically, by substitution and by elimination, with and without technology.	This standard can be met in Glencoe's *MathMatters 2* © 2009 on pages 338-341, 344-347, and 348-351.
10. Solve quadratic equations with real roots by factoring, graphing, using the quadratic formula and with technology.	This standard can be met in Glencoe's *MathMatters 3* © 2009 on pages 520-523 and 540-543.
11. Add, subtract, multiply and divide monomials and polynomials (division of polynomials by monomials only).	**Student Edition:** 404-407, 408-411, 412 #1-#74, 413 #87-#98, 418-421 **Annotated Teacher Edition:** CE 405, 409; ETL 407; GS 418; QA 406, 410; TT 409
Analyze Change	
12. Simplify rational expressions by eliminating common factors and applying properties of integer exponents.	**Student Edition:** 137 ex 2, 138 #5-#8, 139 #40-#42, 140 #41-#48, 418-421, 422 #28-#51, 428 #92-#95 **Annotated Teacher Edition:** CE 137, 419; QA 420

STANDARDS	PAGE REFERENCES
13. Model and solve problems involving direct and inverse variation using proportional reasoning.	**Student Edition:** 84-87, 88 #34-#54, 89 #91-#96, 260-263, 268 #1-#24, 269 #55-#66, 296 #11-#16 **Annotated Teacher Edition:** AA 85; DI 84, 261; QA 86
14. Describe the relationship between slope and the graph of a direct variation and inverse variation.	**Student Edition:** 327 #41 *MathWorks* 333
15. Describe how a change in the value of a constant in a linear or quadratic equation affects the related graphs.	**Student Edition:** 331 #33-#34
Data Analysis and Probability Standard	
Data Collection	
1. Classify data as univariate (single variable) or bivariate (two variables) and as quantitative (measurement) or qualitative (categorical) data.	**Student Edition:** 306-307 **Annotated Teacher Edition:** ETL 307; QA 307
2. Create a scatterplot for a set of bivariate data, sketch the line of best fit, and interpret the slope of the line of best fit.	**Student Edition:** 34-37, 44 #35-#40, 83 #44-#46, 340 ex 3 **Annotated Teacher Edition:** CE 35; ETL 35; GS 34; QA 36; TT 34
Statistical Methods	
3. Analyze and interpret frequency distributions based on spread, symmetry, skewness, clusters and outliers.	**Student Edition:** 16-19, 22 #1-#9, 23 #28-#29, 33 #23-#24, 43 #23-#28, 45 #7-#12, 47 #17 **Annotated Teacher Edition:** ETL 16; QA 18
4. Describe and compare various types of studies (survey, observation, experiment), and identify possible misuses of statistical data.	**Student Edition:** 6-9, 14 #1-#7, 15 #27-#29, 23 #22-#23, 33 #21, 42 #11-#15, 45 #1, 46 #1 **Annotated Teacher Edition:** CE 7; DI 6; QA 8
5. Describe characteristics and limitations of sampling methods, and analyze the effects of random versus biased sampling; e.g., determine and justify whether the sample is likely to be representative of the population.	**Student Edition:** 6-9, 14 #1-#7, 15 #27-#31, 33 #21 *Chapter Investigation* 3, 44 **Annotated Teacher Edition:** CE 7; CI 3; DI 6; ETL 7, 30

STANDARDS	PAGE REFERENCES
6. Make inferences about relationships in bivariant data, and recognize the difference between evidence of relationship (correlation) and causation.	**Student Edition:** 34-37, 44 #35-#40, 83 #44-#46, 340 ex 3 **Annotated Teacher Edition:** CE 35; ETL 35; GS 34; QA 36; TT 34
Probability	
7. Use counting techniques and the Fundamental Counting principle to determine the total number of possible outcomes for mathematical situations.	**Student Edition:** 450-453, 454 #15-#19, 455 #35-#36, 463 #52-#53, 469 #31-#36 **Annotated Teacher Edition:** CE 451; DI 450; QA 452; TT 451, 453
8. Describe, create and analyze a sample space and use it to calculate probability.	**Student Edition:** 446-449, 454 #1-#8, 455 #33-#34, 463 #52-#53, 469 #29-#30, 471 #10-#11 **Annotated Teacher Edition:** GS 446; QA 448; TT 446, 447
9. Identify situations involving independent and dependent events, and explain differences between, and common misconceptions about, probabilities associated with those events.	**Student Edition:** 456-459, 462 #1-#18, 470 #41-#48 **Annotated Teacher Edition:** CE 457; ETL 458; QA 458
10. Use theoretical and experimental probability, including simulations or random numbers, to estimate probabilities and to solve problems dealing with uncertainty; e.g., compound events, independent events, simple dependent events.	**Student Edition:** 440-443, 444 #25-#36, 445 #47-#51, 456-459, 462 #1-#18, 470 #41-#48 **Annotated Teacher Edition:** CE 441, 457; ETL 458; QA 442, 458