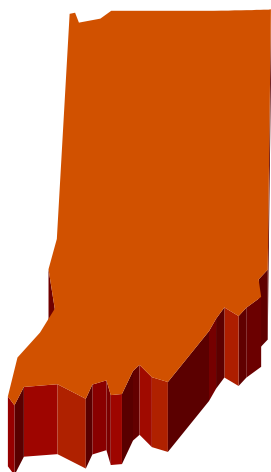
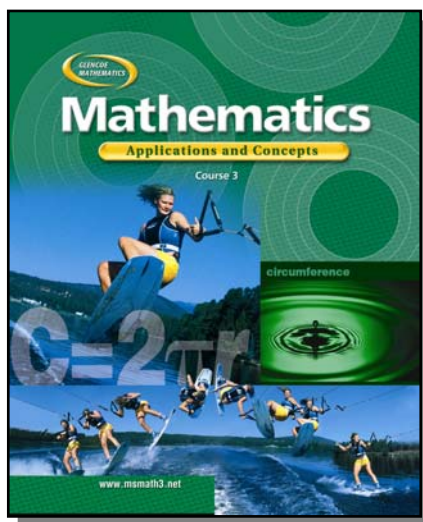


# Glencoe/McGraw-Hill

**Mathematics: Applications and Concepts,  
Course 3 ©2004  
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INDIANA EDITION



alignment to

**Indiana  
Academic Mathematics Standards  
Grade 8**

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**ALIGNMENT TO**

**INDIANA ACADEMIC MATHEMATICS STANDARDS  
GRADE 8**

OBJECTIVES	PAGE REFERENCES
<b>Standard 1</b> <b>Number Sense</b> <i>Students know the properties of rational and irrational numbers expressed in a variety of forms. They understand and use exponents, powers, and roots.</i>	
Read, write, compare, and solve problems using decimals in scientific notation.	SE: 104–105, 106–107, 110, 112 TWE: 104–105, 106–107, 110, 112
Know that every rational number is either a terminating or repeating decimal and that every irrational number is a non-repeating decimal.	SE: 62, 64, 125–128, 147 TWE: 62, 64, 125–128, 147
Understand that computations with an irrational number and a rational number (other than zero) produce an irrational number.	The opportunity to address this objective is available. See the following:  SE: 125–126, 129 TWE: 125–126, 129
Understand and evaluate negative integer exponents.	SE: 99-100, 104-107, 110 TWE: 99-100, 104-107, 110
Use the laws of exponents for integer exponents.	SE: 584–587, 594 TWE: 584–587, 594
Use the inverse relationship between squaring and finding the square root of a perfect square integer.	SE: 116–119, 146 TWE: 116–119, 146
Calculate and find approximations of square roots.	SE: 116, 119, 120-121, 126-127, 146-147 TWE: 116-119, 120-121, 126-127, 146-147

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OBJECTIVES	PAGE REFERENCES
<b>Standard 2</b> <b>Computation</b> <i>Students compute with rational numbers expressed in a variety of forms. They solve problems involving ratios, proportions, and percentages.</i>	
Add, subtract, multiply, and divide rational numbers (integers, fractions, and terminating decimals) in multi-step problems.	SE: 8, 10, 85, 91, 97, 119, 124, 159, 164, 169, 213, 227, 231, 234, 235, 240, 318, 377, 419, 538  TWE: 8, 10, 85, 91, 97, 119, 124, 159, 164, 169, 213, 227, 231, 234, 235, 240, 318, 377, 419, 538
Solve problems by computing simple and compound interest.	SE: 241-244, 245, 248  TWE: 241-244, 245, 248
Use estimation techniques to decide whether answers to computations on a calculator are reasonable.	SE: 121, 319-321, 336  TWE: 121, 319-321, 336
Use mental arithmetic to compute with common fractions, decimals, powers, and percents.	SE: 25, 63, 73, 78, 127, 133, 160, 188, 220-221, 238, 375, 397, 401, 407  TWE: 25, 63, 73, 78, 127, 133, 160, 188, 220-221, 238, 375, 397, 401, 407
<b>Standard 3</b> <b>Algebra and Functions</b> <i>Students solve simple linear equations and inequalities. They interpret and evaluate expressions involving integer powers. They graph and interpret functions. They understand the concepts of slope and rate.</i>	
Write and solve linear equations and inequalities in one variable, interpret the solution or solutions in their context, and verify the reasonableness of the results.	SE: 40-42, 45-49, 50-53, 56, 92-95, 110, 232-235, 242, 248, 262, 272, 307, 474-477, 478-481, 482-483, 484-487, 493-494, 496-499, 500-504, 505-506  TWE: 40-42, 45-49, 50-53, 56, 92-95, 110, 232-235, 242, 248, 262, 272, 307, 474-477, 478-481, 482-483, 484-487, 493-494, 496-499, 500-504, 505-506

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<b>OBJECTIVES</b>	<b>PAGE REFERENCES</b>
Solve systems of two linear equations using the substitution method and identify approximate solutions graphically.	SE: 544–547, 554 TWE: 544–547, 554
Interpret positive integer powers as repeated multiplication and negative integer powers as repeated division or multiplication by the multiplicative inverse.	SE: 98–101, 104 TWE: 98–101, 104
Use the correct order of operations to find the values of algebraic expressions involving powers.	SE: 11-12, 14, 55 TWE: 11-12, 14, 55
Identify and graph linear functions, and identify lines with positive and negative slope.	SE: 522-525, 526–527, 532, 534-536, 544-546, 548-549, 553-554, 561-562 TWE: 522-525, 526–527, 532, 534-536, 544-546, 548-549, 553-554, 561-562
Find the slope of a linear function given the equation and write the equation of a line given the slope and any point on the line.	SE: 533-535, 540, 553 TWE: 533-535, 540, 553
Demonstrate an understanding of rate as a measure of one quantity with respect to another quantity.	SE: 157-159, 160-164, 165, 166-167 TWE: 157-159, 160-164, 165, 166-167
Demonstrate an understanding of the relationships among tables, equations, verbal expressions, and graphs of linear functions.	SE: 517-520, 522–525, 532, 533-536, 540, 544-547, 548-549, 553-554 TWE: 517-520, 522–525, 532, 533-536, 540, 544-547, 548-549, 553-554
Represent simple quadratic functions using verbal descriptions, tables, graphs, and formulas, and translate among these representations.	SE: 564, 565-568 TWE: 564, 565-568
Graph functions of the form $y = nx^2$ and $y = nx^3$ and describe the similarities and differences in the graphs.	SE: 564, 565-568 TWE: 564, 565-568

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<b>OBJECTIVES</b>	<b>PAGE REFERENCES</b>
<b>Standard 4</b> <b>Geometry</b> <i>Students deepen their understanding of plane and solid geometric shapes and properties by constructing shapes that meet given conditions, by identifying attributes of shapes, and by applying geometric concepts to solve problems.</i>	
Identify and describe basic properties of geometric shapes: altitudes, diagonals, angle bisectors, and perpendicular bisectors; central angles, radii, diameters, and chords of circles.	SE: 132, 256-259, 262-264, 266, 267, 272-274, 279-281, 286-289, 314-316, 319-320, 331-334, 347-348, 352-353  TWE: 132, 256-259, 262-264, 266, 267, 272-274, 279-281, 286-289, 314-316, 319-320, 331-334, 347-348, 352-353
Perform simple constructions such as bisectors of segments and angles, copies of segments and angles, and perpendicular segments. Describe and justify the constructions.	SE: 261, 266, 271, 283  TWE: 261, 266, 271, 283
Identify properties of three-dimensional geometric objects (e.g., diagonals of rectangular solids) and describe how two or more figures intersect in a plane or in space.	SE: 140, 330, 331–334, 345, 346, 347-348, 351, 352-353  TWE: 140, 330, 331–334, 345, 346, 347-348, 351, 352-353
Draw the translation (slide), rotation (turn), reflection (flip), and dilation (stretches and shrinks) of shapes.	SE: 194–195, 290–292, 296, 297 300–301  TWE: 194–195, 290–292, 296, 297 300–301
Use the Pythagorean Theorem and its converse to solve problems in two and three dimensions.	SE: 132, 133 134, 137, 138, 141, 143  TWE: 132, 133 134, 137, 138, 141, 143
<b>Standard 5</b> <b>Measurement</b> <i>Students convert between units of measure and use rates and scale factors to solve problems. They compute the perimeter, area, and volume of geometric objects. They investigate how perimeter, area, and volume are affected by changes of scale.</i>	
Convert common measurements for length, area, volume, weight, capacity, and time to equivalent measurements within the same system.	SE: 52, 338, 604–605, 606–607  TWE: 52, 338, 604–605, 606–607

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<b>OBJECTIVES</b>	<b>PAGE REFERENCES</b>
Solve simple problems involving rates and derived measurements for such attributes as velocity and density.	SE: 157-159, 160-163, 165, 198 TWE: 157-159, 160-163, 165, 198
Solve problems involving scale factors, area, and volume, using ratio and proportion.	SE: 179-182, 184-187, 194-197, 318, 339, 356-357 TWE: 179-182, 184-187, 194-197, 318, 339, 356-357
Use formulas for finding the perimeter and area of basic two-dimensional shapes and the surface area and volume of basic three-dimensional shapes, including rectangles, parallelograms, trapezoids, triangles, circles, prisms, cylinders, and pyramids.	SE: 314, 315, 316, 320, 321, 335, 336, 342, 343, 347, 348, 349 352, 353, 613 TWE: 314, 315, 316, 320, 321, 335, 336, 342, 343, 347, 348, 349 352, 353, 613
Estimate and compute the area and volume of irregular two- and three-dimensional shapes by breaking the shapes down into more basic geometric objects.	SE: 326–329, 337-338, 350-351, 354-355, 364 TWE: 326–329, 337-338, 350-351, 354-355, 364
<b>Standard 6</b>	
<b>Data Analysis and Probability</b>	
<i>Students collect, organize, represent, and interpret relationships in data sets that have one or more variables. They determine probabilities and use them to make predictions about events.</i>	
Identify claims based on statistical data and, in simple cases, evaluate the reasonableness of the claims. Design a study to investigate the claim.	SE: 450–453, 424, 429, 433, 438, 447 TWE: 450–453, 424, 429, 433, 438, 447
Identify different methods of selecting samples, analyzing the strengths and weaknesses of each method, and the possible bias in a sample or display.	SE: 406–409 TWE: 406–409
Understand the meaning of, and be able to identify or compute the minimum, the lower quartile, the median, the upper quartile, the interquartile range, and the maximum of a data set.	SE: 435-438, 439, 442–445, 446-449, 459-460 TWE: 435-438, 439, 442–445, 446-449, 459-460

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<b>OBJECTIVES</b>	<b>PAGE REFERENCES</b>
Analyze, interpret, and display single- and two-variable data in appropriate bar, line and circle graphs, stem-and-leaf plots and box-and-whisker plots, and explain which types of display are appropriate for various data sets.	SE: 421, 426, 430, 431, 446, 447, 602 TWE: 421, 426, 430, 431, 446, 447, 602
Represent two-variable data with a scatterplot on the coordinate plane and describe how the data points are distributed. If the pattern appears to be linear, draw a line that appears to best fit the data, and write the equation of that line.	SE: 539-542, 543, 554 TWE: 539-542, 543, 554
Understand and recognize equally likely events.	SE: 374-377 TWE: 374-377
Find the number of possible arrangements of several objects by using the Basic Counting Principle.	SE: 381-383, 384, 411 TWE: 381-383, 384, 411
<b>Standard 7</b>	
<b>Problem Solving</b>	
<i>Students make decisions about how to approach problems and communicate their ideas.</i>	
Analyze problems by identifying relationships, telling relevant from irrelevant information, identifying missing information, sequencing and prioritizing information, and observing patterns.	SE: 8, 43-44, 96-97, 123-124, 176-177, 226-227, 236, 324-325, 378-379, 419-420, 488-489 TWE: 8, 43-44, 96-97, 123-124, 176-177, 226-227, 236, 324-325, 378-379, 419-420, 488-489
Make and justify mathematical conjectures based on a general description of a mathematical question or problem.	SE: 176-177, 488-489, 537-538, 588-589 TWE: 176-177, 488-489, 537-538, 588-589
Decide when and how to divide a problem into simpler parts.	SE: 43-44, 176-177, 226-227, 236, 474 TWE: 43-44, 176-177, 226-227, 236, 474
<i>Students use strategies, skills, and concepts in finding and communicating solutions to problems.</i>	
Apply strategies and results from simpler problems to more complex problems.	SE: 8-9, 236-237, 324-325, 474-475 TWE: 8-9, 236-237, 324-325, 474-475

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<b>OBJECTIVES</b>	<b>PAGE REFERENCES</b>
Make and test conjectures by using inductive reasoning.	SE: 22, 245, 276-277, 324-325, 392 TWE: 22, 245, 276-277, 324-325, 392
Express the solution clearly and logically by using the appropriate mathematical terms and notation. Support solutions with evidence in both verbal and symbolic work.	SE: 22, 23-24, 71, 123, 176, 324, 418, 468, 482-483 TWE: 22, 23-24, 71, 123, 176, 324, 418, 468, 482-483
Recognize the relative advantages of exact and approximate solutions to problems and give answers to a specified degree of accuracy.	SE: 120-121, 228-229, 321, 337 TWE: 120-121, 228-229, 321, 337
Select and apply appropriate methods for estimating results of rational-number computations.	SE: 89, 226-227, 228-231, 284, 336, 600-601 TWE: 89, 226-227, 228-231, 248, 336, 600-601
Use graphing to estimate solutions and check the estimates with analytic approaches.	SE: 17, 18, 19, 22, 126, 521, 539-540, 548-549, 544, 545 TWE: 17, 18, 19, 22, 126, 521, 539-540, 548-549, 544, 545
Make precise calculations and check the validity of the results in the context of the problem.	SE: 8, 96, 123, 176, 324, 488 TWE: 8, 96, 123, 176, 324, 488
<i>Students determine when a solution is complete and reasonable, and move beyond a particular problem by generalizing to other situations.</i>	
Decide whether a solution is reasonable in the context of the original situation.	SE: 8, 43, 176, 226, 324, 378, 419, 488, 588 TWE: 8, 43, 176, 226, 324, 378, 419, 488, 588
Note the method of finding the solution and show a conceptual understanding of the method by solving similar problems.	SE: 8-9, 44-45, 96-97, 123-124, 176-177, 226-227, 276-277, 324-325, 378-379, 418-419, 488-489, 537-538, 588-589 TWE: 8-9, 44-45, 96-97, 123-124, 176-177, 226-227, 276-277, 324-325, 378-379, 418-419, 488-489, 537-538, 588-589

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