



Math Connects

Concepts, Skills, and Problem Solving

Course 3

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| STANDARDS | PAGE REFERENCES |
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| NUMBER AND OPERATIONS | |
| Understand real number concepts | |
| N.ME.08.01 Understand the meaning of a square root of a number and its connection to the square whose area is the number; understand the meaning of a cube root and its connection to the volume of a cube. | Student Edition: 144-147, 148-151, 159 #44, LA12-LA14 <i>Mid-Chapter Quiz</i> 160 #1-#18 <i>Real-World Link</i> 149 <i>Study Guide and Review</i> 180 3-1, 3-2 Teacher Wraparound Edition: AE 145; AM 148a; FM 145 |
| N.ME.08.02 Understand meanings for zero and negative integer exponents. | Student Edition: 127, 129 #41-#44, 130, 131 Example 4, 132 #3-#4, #14-#17, #22-#26, #29 <i>Get Ready</i> 545 <i>Practice Test</i> 139 #15-#18 <i>Study Guide and Review</i> 138 Teacher Wraparound Edition: PA 129; T 126 |

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| <p>N.ME.08.03 Understand that in decimal form, rational numbers either terminate or eventually repeat, and that calculators truncate or round repeating decimals; locate rational numbers on the number line; know fraction forms of common repeating decimals, e.g., $0.1 = \frac{1}{9}$; $0.3 = \frac{1}{3}$.</p> | <p>Student Edition: 85-86, 87 #1-#7, #14-#29, 88 #49-#50, 89 #51, 93 <i>Study Guide and Review</i> 135 2-1 <i>Study Tip</i> 85 Teacher Wraparound Edition: AE 85; FM 85; PA 86</p> |
| <p>N.ME.08.04 Understand that irrational numbers are those that cannot be expressed as the quotient of two integers, and cannot be represented by terminating or repeating decimals; approximate the position of familiar irrational numbers, e.g., $\sqrt{2}$, $\sqrt{3}$, π, on the number line.</p> | <p>Student Edition: 149-150, 155, 158 #19-#22 <i>Geometry Lab</i> 172 <i>Study Guide and Review</i> 180 3-2 <i>Test Practice</i> 151 #35, 159 Teacher Wraparound Edition: A 159; FM 156</p> |
| <p>N.FL.08.05 Estimate and solve problems with square roots and cube roots using calculators.</p> | <p>Student Edition: 144-147, 148-151, 157 Example 7, 158 #10, #29-#30, 159 #43, 163-166, 167-171, 560, LA12-LA14 <i>Mini Lab</i> 162 Teacher Wraparound Edition: AE 157</p> |
| <p>N.FL.08.06 Find square roots of perfect squares and approximate the square roots of non-perfect squares by locating between consecutive integers, e.g., $\sqrt{130}$ is between 11 and 12.</p> | <p>Student Edition: 144-147, 148-151, 156-159, 166 #39 <i>Mid-Chapter Quiz</i> 160 #1-#6, #10-#18 <i>Practice Test</i> 183 #1-#7 <i>Study Guide and Review</i> 180 3-1, 3-2 Teacher Wraparound Edition: AE 149, 156</p> |
| Solve problems | |
| <p>N.MR.08.07 Understand percent increase and percent decrease in both sum and product form, e.g., 3% increase of a quantity x is $x + .03x = 1.03x$.</p> | <p>Student Edition: 284-289 <i>Study Guide and Review</i> 298 5-8 Teacher Wraparound Edition: AE 285; EA 289; FM 285; T 284</p> |

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| <p>N.MR.08.08 Solve problems involving percent increases and decreases.</p> | <p>Student Edition: 285 Example 1, Example 2, 286 Example 3, 287-289 <i>Get Ready</i> 284 <i>Practice Test</i> 299 #22-#24 <i>Study Guide and Review</i> 298 5-8 Teacher Wraparound Edition: AE 286, 287; PA 287; T 284</p> |
| <p>N.FL.08.09 Solve problems involving compounded interest or multiple discounts.</p> | <p>Student Edition: 289 #28 <i>Spreadsheet Lab</i> 294 Teacher Wraparound Edition: PA 470</p> |
| <p>N.MR.08.10 Calculate weighted averages such as course grades, consumer price indices, and sports ratings.</p> | <p>Student Edition: 591-596, 599-604 <i>Spreadsheet Lab</i> 597 <i>Study Guide and Review</i> 624 11-4, 625 11-5 Teacher Wraparound Edition: A 604; AE 593</p> |
| <p>N.FL.08.11 Solve problems involving ratio units, such as miles per hour, dollars per pound, or persons per square mile.*</p> | <p>Student Edition: 191 Example 3, 192 #5-#6, #16-#23, 193 #25, 197 #21-#22, 198 Example 1, 199 Example 2, 203 #31 <i>Test Practice</i> 193, 209 #29 Teacher Wraparound Edition: A 193; AE 191</p> |
| ALGEBRA | |
| Understand the concept of non-linear functions using basic examples | |
| <p>A.RP.08.01 Identify and represent linear functions, quadratic functions, and other simple functions including inversely proportional relationships ($y = k/x$); cubics ($y = ax^3$); roots ($y = \sqrt{x}$); and exponentials ($y = a^x$, $a > 0$); using tables, graphs, and equations.*</p> | <p>Student Edition: 475-479, 495-499, 528-533, 534-537 <i>Graphing Calculator Lab</i> 500-501 <i>Study Guide and Review</i> 519 9-2, 9-3, 564 10-1, 10-2 Teacher Wraparound Edition: AE 476, 477, 496; T 475</p> |

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| <p>A.PA.08.02 For basic functions, e.g., simple quadratics, direct and indirect variation, and population growth, describe how changes in one variable affect the others.</p> | <p>Student Edition: 475-479, 481-486, 487-491, 495-499, 528-532, 534-537 <i>Graphing Calculator Lab</i> 544 #3, #7 <i>Study Guide and Review</i> 519 9-3, 521 9-6</p> <p>Teacher Wraparound Edition: A 480; T 475</p> |
| <p>A.PA.08.03 Recognize basic functions in problem context, e.g., area of a circle is πr^2, volume of a sphere is $\frac{4}{3} \pi r^3$, and represent them using tables, graphs, and formulas.</p> | <p>Student Edition: 472 #27, 491 #22, 532 #28-#29, #36, 536 #28-#29, 541 Example 2, 542 #18-#19 <i>Get Ready</i> 540 <i>Mini Lab</i> 534</p> |
| <p>A.RP.08.04 Use the vertical line test to determine if a graph represents a function in one variable.</p> | <p>The vertical line test for functions can be used with the following examples.</p> <p>Student Edition: 476-480, 528-533</p> |
| Understand and represent quadratic functions | |
| <p>A.RP.08.05 Relate quadratic functions in factored form and vertex form to their graphs, and vice versa; in particular, note that solutions of a quadratic equation are the x-intercepts of the corresponding quadratic function.</p> | <p>Student Edition: 534-537, 543 #33-#36 <i>Graphing Calculator Lab</i> 544 <i>Mid-Chapter Quiz</i> 549 #10-#11 <i>Study Guide and Review</i> 564 10-2 <i>Test Practice</i> 569 #5</p> <p>Teacher Wraparound Edition: AE 535</p> |
| <p>A.RP.08.06 Graph factorable quadratic functions, finding where the graph intersects the x-axis and the coordinates of the vertex; use words “parabola” and “roots”; include functions in vertex form and those with leading coefficient -1, e.g., $y = x^2 - 36$, $y = (x - 2)^2 - 9$; $y = -x^2$; $y = -(x - 3)^2$.</p> | <p>Student Edition: 534-537, 543 #33-#36 <i>Graphing Calculator Lab</i> 544 <i>Mid-Chapter Quiz</i> 549 #10-#11 <i>Study Guide and Review</i> 564 10-2 <i>Test Practice</i> 569 #5</p> <p>Teacher Wraparound Edition: AE 536; FM 535; PA 537</p> |
| Recognize, represent, and apply common formulas | |
| <p>A.FO.08.07 Recognize and apply the common formulas: $(a + b)^2 = a^2 + 2 ab + b^2$ $(a - b)^2 = a^2 - 2 ab + b^2$ $(a + b)(a - b) = a^2 - b^2$; represent geometrically.</p> | <p>See Glencoe’s <i>Algebra 1</i> © 2008 Lessons 8-5 and 8-6.</p> |

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| <p>A.FO.08.08 Factor simple quadratic expressions with integer coefficients, e.g., $x^2 + 6x + 9$, $x^2 + 2x - 3$, and $x^2 - 4$; solve simple quadratic equations, e.g., $x^2 = 16$ or $x^2 = 5$ (by taking square roots); $x^2 - x - 6 = 0$, $x^2 - 2x = 15$ (by factoring); verify solutions by evaluation.</p> | <p>Simple quadratic equations are covered on the following pages. Student Edition: 144-147</p> |
| <p>A.FO.08.09 Solve applied problems involving simple quadratic equations.</p> | <p>Student Edition: 535 Example 5, 536 #20-#21 Teacher Wraparound Edition: AE 536</p> |
| <p>Understand solutions and solve equations, simultaneous equations, and linear inequalities</p> | |
| <p>A.FO.08.10 Understand that to solve the equation $f(x) = g(x)$ means to find all values of x for which the equation is true, e.g., determine whether a given value, or values from a given set, is a solution of an equation (0 is a solution of $3x^2 + 2 = 4x + 2$, but 1 is not a solution).</p> | <p>Student Edition: 470-472, 476 Example 2, 478 #5, 479 #17, #23, 541 Example 2 <i>Get Ready</i> 475 <i>Graphing Calculator Lab</i> 500-501 Teacher Wraparound Edition: AE 470; FM 476</p> |
| <p>A.FO.08.11 Solve simultaneous linear equations in two variables by graphing, by substitution, and by linear combination; estimate solutions using graphs; include examples with no solutions and infinitely many solutions.</p> | <p>Student Edition: 502-507, 515 #34 <i>Problem-Solving Investigation</i> 509 #3 <i>Study Guide and Review</i> 521 9-7 Teacher Wraparound Edition: AE 503, 504; PA 505</p> |
| <p>A.FO.08.12 Solve linear inequalities in one and two variables, and graph the solution sets.</p> | <p>Student Edition: 441-448, 449-453 <i>Practice Test</i> 459 #15, #24-#25 <i>Study Guide and Review</i> 457 Teacher Wraparound Edition: AE 443, 446, 450, 451</p> |
| <p>A.FO.08.13 Set up and solve applied problems involving simultaneous linear equations and linear inequalities.</p> | <p>Student Edition: 504-505 Example 4, #5-#6, 506 #16-#24, 515 #34 <i>Get Ready</i> 502 <i>Problem-Solving Investigation</i> 509 #3 <i>Study Guide and Review</i> 521 9-7 Teacher Wraparound Edition: AE 503, 504; PA 505</p> |

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| GEOMETRY | |
| Understand and use the Pythagorean Theorem | |
| <p>G.GS.08.01 Understand at least one proof of the Pythagorean Theorem; use the Pythagorean Theorem and its converse to solve applied problems including perimeter, area, and volume problems.</p> | <p>Student Edition: 162-166, 167-171, 178 #45-#48 <i>Geometry Lab</i> 161 <i>Study Guide and Review</i> 181 3-5, 182 3-6</p> <p>Teacher Wraparound Edition: AE 168; FM 163; PT 164</p> |
| <p>G.LO.08.02 Find the distance between two points on the coordinate plane using the distance formula; recognize that the distance formula is an application of the Pythagorean Theorem.</p> | <p>Student Edition: 173-178 <i>Practice Test</i> 183 #22 <i>Study Guide and Review</i> 182 3-7</p> <p>Teacher Wraparound Edition: A 178; AE 174, 175, PA 175; T 173</p> |
| Solve problems about geometric figures | |
| <p>G.SR.08.03 Understand the definition of a circle; know and use the formulas for circumference and area of a circle to solve problems.</p> | <p>Student Edition: 352-357 <i>Mini Lab</i> 352 <i>Study Guide and Review</i> 406 7-1</p> <p>Teacher Wraparound Edition: A 357; AE 353, 357; PA 354</p> |
| <p>G.SR.08.04 Find area and perimeter of complex figures by sub-dividing them into basic shapes (quadrilaterals, triangles, circles).</p> | <p>Student Edition: 363-367, 372 #29 <i>Measurement Lab</i> 362 <i>Problem-Solving Investigation</i> 360 <i>Study Guide and Review</i> 406 7-3 <i>Test Practice</i> 147 #43</p> <p>Teacher Wraparound Edition: AE 364, 365; T 363</p> |
| <p>G.SR.08.05 Solve applied problems involving areas of triangles, quadrilaterals, and circles.</p> | <p>Student Edition: 13, 354 Example 5, 355 #16-#19, 356 <i>Study Guide and Review</i> 75 Example 1 <i>Test Practice</i> 147 #44, 184 #5</p> <p>Teacher Wraparound Edition: AE 354; PA 354</p> |

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| Understand concepts of volume and surface area, and apply formulas | |
| <p>G.SR.08.06 Know the volume formulas for generalized cylinders ((area of base) x height), generalized cones and pyramids ($\frac{1}{3}$ (area of base) x height), and spheres ($\frac{4}{3} \pi$ (radius)³) and apply them to solve problems.</p> | <p>Student Edition: 373-378, 380-384, 391 #24-#25, 396 #22 <i>Concepts and Skills Bank</i> 741 <i>Mid-Chapter Quiz</i> 379 #10-#12 <i>Study Guide and Review</i> 407 7-5, 7-6</p> <p>Teacher Wraparound Edition: AE 374, 375, 381</p> |
| <p>G.SR.08.07 Understand the concept of surface area, and find the surface area of prisms, cones, spheres, pyramids, and cylinders.</p> | <p>Student Edition: 386-391, 393-395 <i>Measurement Lab</i> 385 <i>Spreadsheet Lab</i> 397-398 <i>Study Guide and Review</i> 408 7-7, 7-8</p> <p>Teacher Wraparound Edition: AE 387, 388, 389, 394; PA 387; T 393</p> |
| Visualize solids | |
| <p>G.SR.08.08 Sketch a variety of two-dimensional representations of three-dimensional solids including orthogonal views (top, front, and side), picture views (projective or isometric), and nets; use such two-dimensional representations to help solve problems.</p> | <p>Student Edition: 161, 368-372, 388, 393 <i>Geometry Lab</i> 312, 385, 495 <i>Measurement Lab</i> 385, 392 <i>Mini Lab</i> 380, 386 <i>Test Practice</i> 372 #27, 396 #20</p> <p>Teacher Wraparound Edition: T 380, 392</p> |
| Understand and apply concepts of transformation and symmetry | |
| <p>G.TR.08.09 Understand the definition of a dilation from a point in the plane, and relate it to the definition of similar polygons.</p> | <p>Student Edition: 225-230, 232-235 <i>Spreadsheet Lab</i> 231 <i>Study Guide and Review</i> 246 4-8</p> <p>Teacher Wraparound Edition: FM 226; T 225, 231</p> |
| <p>G.TR.08.10 Understand and use reflective and rotational symmetries of two-dimensional shapes and relate them to transformations to solve problems.</p> | <p>Student Edition: 332-336, 337-341, 357 #41-#42 <i>Study Guide and Review</i> 345 6-6, 346 <i>Test Practice</i> 348 #1</p> <p>Teacher Wraparound Edition: A 336; AE 338; FM 338; T 332</p> |

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| DATA AND PROBABILITY | |
| Draw, explain, and justify conclusions based on data | |
| <p>D.AN.08.01 Determine which measure of central tendency (mean, median, mode) best represents a data set, e.g., salaries, home prices, for answering certain questions; justify the choice made.</p> | <p>Student Edition: 591-596, 599-604, 610 #30-#32, 616 #24-#25 <i>Spreadsheet Lab</i> 597 <i>Study Guide and Review</i> 624 11-4, 625 11-5</p> <p>Teacher Wraparound Edition: AE 600, 601</p> |
| <p>D.AN.08.02 Recognize practices of collecting and displaying data that may bias the presentation or analysis.</p> | <p>Student Edition: 654-658 <i>Practice Test</i> 663 #14-#15 <i>Study Guide and Review</i> 662 12-5</p> <p>Teacher Wraparound Edition: A 658; FM 654</p> |
| Understand probability concepts for simple and compound events | |
| <p>D.PR.08.03 <i>Compute relative frequencies from a table of experimental results for a repeated event. Interpret the results using relationship of probability to relative frequency.*</i></p> | <p>Student Edition: 643-647, 658 #30 <i>Mid-Chapter Quiz</i> 652 #12-#14 <i>Probability Lab</i> 648-649 <i>Study Guide and Review</i> 661</p> <p>Teacher Wraparound Edition: AE 644; DI 646; PA 644; T 643</p> |
| <p>D.PR.08.04 Apply the Basic Counting Principle to find total number of outcomes possible for independent and dependent events, and calculate the probabilities using organized lists or tree diagrams.</p> | <p>Student Edition: 632-636, 642 #37, 647 #27 <i>Mid-Chapter Quiz</i> 652 #1-#2 <i>Study Guide and Review</i> 660 12-1</p> <p>Teacher Wraparound Edition: AE 633</p> |
| <p>D.PR.08.05 <i>Find and/or compare the theoretical probability, the experimental probability, and/or the relative frequency of a given event.*</i></p> | <p>Student Edition: 637-642, 643-647 <i>Concepts and Skills Bank</i> 746-748 <i>Mid-Chapter Quiz</i> 652 #4-#9 <i>Probability Lab</i> 648-649 <i>Problem-Solving Investigation</i> 650, 651 #12 <i>Study Guide and Review</i> 660 12-2, 661</p> <p>Teacher Wraparound Edition: PA 644</p> |

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| <p>D.PR.08.06 Understand the difference between independent and dependent events, and recognize common misconceptions involving probability, e.g., Alice rolls a 6 on a die three times in a row; she is just as likely to roll a 6 on the fourth roll as she was on any previous roll.</p> | <p>Student Edition: 637-642, 648 #25-#26 <i>Foldables</i> 659 <i>Mid-Chapter Quiz</i> 652 #3-#10 <i>Study Guide and Review</i> 660 12-2</p> <p>Teacher Wraparound Edition: A 642; FM 638; PA 639</p> |

* *revised expectations in italics*