



# Algebra 1

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| STANDARDS   |   | PAGE REFERENCES   |
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| Grades 9-10   |   |   |
| Standard 1: Number and Operation  |   |   |
| Standard 1: Students understand and use basic and advanced concepts of number and number systems. |   |   |
| Benchmark Expectations  |   |   |
| NUMBERS, NUMBER RELATIONSHIPS, AND NUMBER SYSTEMS   |   |   |
| 9-10.1.1  | Express numbers between one-billionth and one billion in fraction, decimal, and verbal form; express numbers of all magnitudes in scientific notation                             | <b>Student Edition:</b><br>46-52, 78-84, 85-90, 92-97, 98-103, 105-110, 111-115, 122-128, 187-195, 213-218, 220-225, 260-265, 266-270, 301-307, 308-313<br><i>Graphing Calculator Lab</i> 259                             |
| 9-10.1.2  | Describe the hierarchal relationships (e.g., integers are rationals) among subsets of the real number system; i.e., reals, rationals, irrationals, integers, wholes, and naturals | <b>Student Edition:</b><br>46-52<br><b>Teacher Wraparound Edition:</b><br>F 48; I 47  |
| 9-10.1.3  | Identify the properties of the real number system; i.e., commutative, associative, distributive, closure, inverse, and identity properties  | <b>Student Edition:</b><br>21-25, 26-31, 33-37, 384-388, 390-395, 398-403, 426-431<br><i>Algebra Lab</i> 27-28, 425<br><i>Reading Mathematics</i> 38<br><b>Teacher Wraparound Edition:</b><br>F 22, 34; Pre-AP 25, 31, 37 |

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| 9-10.1.4 Represent a set of data in a matrix   | See Glencoe <i>Algebra: Concepts and Applications</i> © 2008.<br><b>Student Edition:</b><br>80-81, 578-579<br><i>Chapter 2 Investigation</i> 80-81<br><i>Chapter 13 Investigation</i> 578-579<br><b>Teacher Wraparound Edition:</b> FA 579; MTL 80, 578; TT 81, 579                       |
| <b>OPERATIONS AND THEIR PROPERTIES</b>   |   |
| 9-10.1.5. Use the order of operations and properties of exponents to simplify an algebraic expression  | <b>Student Edition:</b><br>10-14, 21-25, 26-31, 33-37, 358-364, 366-373, 384-388, 390-395, 398-403<br><i>Graphing Calculator Lab</i> 367<br><b>Teacher Wraparound Edition:</b><br>I 359, 367; Pre-AP 14, 395; TfNT 12   |
| 9-10.1.6. Analyze the effects of multiplication, division, raising to a power, and extracting a root on the magnitudes of quantities; e.g., when will the square root of a number be greater than the number itself, or what will happen to the magnitude of a number when you multiply it by a negative number? | <b>Student Edition:</b><br>51 #50, 52 #66, 83 #50-51, 358-364 (especially 57-61), 366-373, 471-477, 533 #53<br><i>Graphing Calculator Lab</i> 367, 478-479  |
| 9-10.1.7. Apply basic properties of exponents to simplify algebraic expressions; i.e., power of a product, power of a power, products and quotients of powers, zero and negative exponents   | <b>Student Edition:</b><br>358-364, 366-373, 384-388, 390-395, 398-403<br><i>Graphing Calculator Lab</i> 367  |
| <b>COMPUTATIONAL FLUENCY AND ESTIMATION</b>  |   |
| 9-10.1.8. Apply estimation skills to predict realistic solutions to problems   | <b>Student Edition:</b><br>78-84, 85-90, 108 Ex5, 109 #34, 111-115, 122-128, 274-275 Ex4, 277 #28, 298 #44, 305 #7, 306 #46, 311 #24, 317 #7, 482-483 Ex5 & 6, 562 Ex3  |
| 9-10.1.9. Select and use a computational technique (i.e., mental calculation, paper-and-pencil, or technology) to solve problems involving real numbers  | <b>Student Edition:</b><br>10-14, 15-20, 78-84, 85-90, 92-97, 105-110, 111-115, 165-170, 253-258, 260-265, 266-270, 294-299, 301-307, 480-485, 486-491, 549-554<br><i>Graphing Calculator Lab</i> 259, 309<br><i>Spreadsheet Lab</i> 252<br><b>Teacher Wraparound Edition:</b><br>TfNT 12 |

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| 9-10.1.10. Explain the reasonableness of a problem's solution and the process used to obtain it   | <b>Student Edition:</b><br>78-84, 85-90, 96 #40-41, 102 #45, 107 Ex4, 111-115, 122-128, 264 #28, 269 #24, 277 #28, 282 Ex2, 283 #18, 305 #33 & 34, 312 #36, 318 #36, 549-554, 560-565, 592 #23  |
| 9-10.1.11. Add, subtract, and perform scalar multiplication on matrices   | See Glencoe <i>Algebra: Concepts and Applications</i> © 2008.<br><b>Student Edition:</b><br>80-81, 578-579<br><i>Chapter 2 Investigation</i> 80-81<br><i>Chapter 13 Investigation</i> 578-579<br><b>Teacher Wraparound Edition:</b><br>FA 579; MTL 80; TT 81, 579 |
| <b>Standard 2: Geometry and Spatial Sense</b>   |   |
| <b>Standard 2: Student understands and applies geometric concepts and spatial relationships to represent and solve problems in mathematical and nonmathematical situations.</b> |   |
| Benchmark Expectations  |   |
| <b>TWO- AND THREE-DIMENSIONAL SHAPES, GEOMETRIC PROPERTIES AND RELATIONSHIPS</b>  |   |
| 9-10.2.1. Identify the properties and attributes of two- and three-dimensional objects that distinguish one from another; e.g., a cylinder has two parallel circular bases      | <b>Student Edition:</b><br><i>Reading Mathematics</i> 314   |
| 9-10.2.2. Determine congruence and similarity among geometric objects   | <b>Student Edition:</b><br>560-565<br><b>Teacher Wraparound Edition:</b><br>DI 562; F 562; Pre-AP 565   |
| 9-10.2.3. Use trigonometric relationships and the Pythagorean Theorem to determine side lengths and angle measures in right triangles   | <b>Student Edition:</b><br>549-554<br><b>Teacher Wraparound Edition:</b><br>Pre-AP 551  |
| 9-10.2.4. Using given information, establish the validity of a conjecture using a two-column or paragraph proof   | The following reference is for algebraic proofs.<br><b>Student Edition:</b><br><i>Reading Math</i> 453  |
| <b>COORDINATE GEOMETRY</b>  |   |
| 9-10.2.5. Use Cartesian coordinates to determine distance, midpoint, and slope  | <b>Student Edition:</b><br>196-2020, 213-218, 220-225, 227-233, 236-241, 555-559<br><b>Teacher Wraparound Edition:</b><br>Pre-AP 559  |

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| 9-10.2.6. Use distance, midpoint, and slope to determine relationships between points, lines, and plane figures in the Cartesian coordinate system; e.g., determine whether a triangle is scalene, isosceles, or equilateral given the coordinates of its vertices | <b>Student Edition:</b><br>236-241, 558 #30-33, 559 #43<br><b>Teacher Wraparound Edition:</b><br>Pre-AP 241   |
| <b>TRANSFORMATION AND SYMMETRY</b>   |   |
| 9-10.2.7. Identify and perform transformations of objects in the plane using sketches (translations, reflections, rotations, and dilations) and coordinates (translations, reflections, and dilations)   | <b>Student Edition:</b><br><i>Graphing Calculator Lab</i> 210-211, 478-479, 504   |
| 9-10.2.8. Describe the effects of combining basic transformations in a plane; e.g., two reflections over parallel lines results in a translation   | See Glencoe <i>Algebra: Concepts and Applications</i> © 2008.<br><b>Student Edition:</b><br>79 #49, 749 #5<br><b>Teacher Wraparound Edition:</b><br>EC 79 |
| <b>VISUALIZATION, SPATIAL REASONING, AND GEOMETRIC MODELING</b>  |   |
| 9-10.2.9. Construct plane figures using traditional and/or technological tools; i.e., congruent segments, congruent angles, angle and segment bisectors, perpendicular and parallel lines  | <b>Student Edition:</b><br>236-241<br><i>Algebra Lab</i> 237  |
| 9-10.2.10. Recognize images of the same object shown from different perspectives; i.e., a two-dimensional image of a three-dimensional object  | <b>Student Edition:</b><br>67 #7, 417 #11   |
| 9-10.2.11. Use geometric models to find solutions to problems in mathematics and other disciplines; e.g., art and architecture   | <b>Student Edition:</b><br>549-554, 560-565   |

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| <b>Standard 3: Data Analysis, Statistics, and Probability</b>  |   |
| <b>Standard 3: Students use data collection and analysis techniques, statistical methods, and probability to solve problems.</b>   |   |
| Benchmark Expectations   |   |
| <b>DATA COLLECTION, DISPLAY, AND INTERPRETATION</b>  |   |
| 9-10.3.1. Construct appropriate displays of given data; i.e., circle graphs, bar graphs, histograms, stem-and-leaf plots, box-and-whisker plots, and scatter plots   | <b>Student Edition:</b><br>227-233<br><i>Algebra Lab</i> 228<br><i>Graphing Calculator Lab</i> 234-235<br><i>Prerequisite Skills</i> 713, 714-715<br><b>Teacher Wraparound Edition:</b><br>Pre-AP 233 |
| 9-10.3.2. Interpret a given visual representation (i.e., circle graphs, bar graphs, histograms, stem-and-leaf plots, box-and-whisker plots, and scatter plots) of a set of data  | <b>Student Edition:</b><br>227-233<br><i>Algebra Lab</i> 228<br><i>Graphing Calculator Lab</i> 234-235<br><i>Prerequisite Skills</i> 713, 714-715<br><b>Teacher Wraparound Edition:</b><br>Pre-AP 233 |
| 9-10.3.3. Identify the variable, sample, and population in a well-designed study; e.g., in an exit poll for a tax increase, the variable is the outcome of the vote, the sample is the set of people surveyed, the population is the set of all voters | <b>Student Edition:</b><br>642-648  |
| <b>PROBABILITY</b>   |   |
| 9-10.3.4. Determine the number of possible outcomes for a given event, using appropriate counting techniques; e.g., fundamental counting principle, factorials, combinations, permutations   | <b>Student Edition:</b><br>650-654, 655-662<br><b>Teacher Wraparound Edition:</b><br>DI 652; F 651, 656; I 657; Pre-AP 662  |
| 9-10.3.5. Calculate experimental and theoretical probabilities with and without replacement  | <b>Student Edition:</b><br>663-670, 677-683<br><i>Algebra Lab</i> 678<br><b>Teacher Wraparound Edition:</b><br>F 678/ Pre-AP 680  |
| 9-10.3.6. Calculate probabilities of compound events using addition and multiplication rules   | <b>Student Edition:</b><br>663-670<br><b>Teacher Wraparound Edition:</b><br>DI 664; F 665; I 666  |

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| <b>STATISTICAL METHODS</b>   |  |   |
| 9-10.3.7.  | Calculate measures of central tendency and spread; i.e., mean, median, mode, range, and quartiles  | <b>Student Edition:</b><br><i>Prerequisite Skills</i> 711-712   |
| 9-10.3.8.  | Discuss relationships among measures of central tendency and spread; i.e., mean, median, mode, range, and quartiles  | The following reference can be used to meet this objective.<br><b>Student Edition:</b><br><i>Prerequisite Skills</i> 711-712              |
| <b>PREDICTIONS, DATA ANALYSIS, AND INFERENCES</b>  |  |   |
| 9-10.3.9.  | Select two points and approximate an equation for the line of best fit (if appropriate) for a set of data  | <b>Student Edition:</b><br>227-233<br><i>Algebra Lab</i> 228<br><i>Graphing Calculator Lab</i> 234-235                                    |
| 9-10.3.10.   | Identify the trend of a set of data and estimate the strength of the correlation between two variables; e.g., strong vs. weak, positive vs. negative               | <b>Student Edition:</b><br>227-233<br><b>Teacher Wraparound Edition:</b><br>F229; Pre-AP 233  |
| <b>Standard 4: Measurement</b>   |  |   |
| <b>Standard 4: Students use concepts and tools of measurement to describe and quantify the world..</b> |  |   |
| <b>Benchmark Expectations</b>  |  |   |
| <b>MEASURABLE ATTRIBUTES, MEASUREMENT SYSTEMS AND UNITS</b>  |  |   |
| 9-10.4.1.  | Select appropriate units and scales for problem situations involving measurement   | <b>Student Edition:</b><br><i>Standardized Test Practice</i> 417 #11  |
| 9-10.4.2.  | Describe the effects of scalar change on the area and volume of a figure; e.g., the effect of doubling one or more edges of a solid on its surface area and volume | <b>Student Edition:</b><br>31 #49, 43 #37-38, 373 #56<br><i>Algebra Lab</i> 142, 365<br><i>Standardized Test Practice</i> 137 #14, 417 #7 |
| 9-10.4.3.  | Use approximations to compare the standard and metric systems of measurement; e.g., a five-kilometer race is about three miles long                                | See <i>Glencoe Algebra: Concepts and Applications</i> © 2008.<br><b>Student Edition:</b><br>352-356, 744 #16                              |
| 9-10.4.4.  | Given a conversion factor, convert between standard and metric measurements  | <b>Student Edition:</b><br>90 #58<br><i>Standardized Test Practice</i> 594  |

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| <b>MEASUREMENT TOOLS, TECHNIQUES, AND FORMULAS</b>  |  |
| 9-10.4.5. Use methods necessary to achieve a specified degree of precision and accuracy (i.e., appropriate number of significant digits) in measurement situations  | See Glencoe <i>Algebra: Concepts and Applications</i> © 2008.<br><b>Student Edition:</b><br>352-353, 375<br><b>Teacher Wraparound Edition:</b><br>5MC 357; ICE 353-354; MTL 352  |
| 9-10.4.6. Employ estimation techniques to evaluate reasonableness of results in measurement situations  | <b>Student Edition:</b><br><i>Algebra Lab</i> 228  |
| 9-10.4.7. Use unit analysis to track units during computations  | <b>Student Edition:</b><br>119 Ex4, 590-594, 595-599   |
| 9-10.4.8. Given a formula list, compute the area of a regular polygon   | Squares are the only regular polygons for which area is calculated. The following references discuss areas of other and can be used to meet this objective.<br><b>Student Edition:</b><br>31 #58-60, 32 #21, 36 #23, 96 #42, 100 Ex 4, 120 #23, 121 #40, 137 #15, 305 #12, 306 #46<br><i>Prerequisite Skills</i> 704-705, 706-707<br><i>Standardized Test Practice</i> 67 #9 |
| 9-10.4.9. Given a formula list, compute the surface area and volume of a right prism, right cylinder, right pyramid, right cone, and sphere   | <b>Student Edition:</b><br>104 #6, 121 #34, 278 #36, 313 #54, 333 #41, 371 #13, 373 #56, 451 #34<br><i>Algebra Lab</i> 72<br><i>Prerequisite Skills</i> 708<br><i>Standardized Test Practice</i> 67 #8, 183 #9, 353 #7   |
| 9-10.4.10. Apply indirect measurement techniques to solve problems involving irregular shapes or inaccessible objects; e.g., calculate the distance across a lake, triangulate an irregular region to find its approximate area | <b>Student Edition:</b><br>121 #35, 380 #53, 393 #52-53, 402 #43 & 48, 430 #39, 451 #32  |

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| <b>Standard 5: Algebra, Functions and Patterns</b>  |   |   |  |
| <b>Standard 5: Students use algebraic concepts, functions, patterns, and relationships to solve problems.</b> |   |   |  |
| Benchmark Expectations  |   |   |  |
| <b>PATTERNS, RELATIONS, AND FUNCTIONS</b>   |   |   |  |
| 9-10.5.1.   | Given the explicit and/or the recursive definition of a sequence, generate a specific term (explicit formula only) or a specified number of terms   | <b>Student Edition:</b><br>165-170<br><i>Standardized Test Practice</i> 248 #5<br><b>Teacher Wraparound Edition:</b><br>Pre-AP 170; TfNT 166  |  |
| 9-10.5.2.   | Express relations and functions using a variety of representations; i.e., numeric, graphic, symbolic, and verbal  | <b>Student Edition:</b><br>143-148, 149-154<br><i>Algebra Lab</i> 142, 145  |  |
| 9-10.5.3.   | Determine whether a relation is a function by examining various representations of the relation; e.g., table, graph, equation, set of ordered pairs   | <b>Student Edition:</b><br>149-154<br><b>Teacher Wraparound Edition:</b><br>F 151   |  |
| 9-10.5.4.   | Perform the operations of addition, subtraction, multiplication, and division on algebraic functions; e.g., given $f(x) = 2x$ and $g(x) = 5x - 7$ , find $f(x) + g(x)$  | <b>Student Edition:</b><br>149-154  |  |
| 9-10.5.5.   | Identify the independent variable, dependent variable, domain, and range of a function  | <b>Student Edition:</b><br>149-154, 325 #33-36, 477 #44-48<br><b>Teacher Wraparound Edition:</b><br>F 151   |  |
| 9-10.5.6.   | Draw graphs of linear and quadratic functions using paper and pencil, labeling key features; e.g., graph a line and label its x-intercept and y-intercept, graph a parabola and label its vertex and one point on each side of the vertex | <b>Student Edition:</b><br>155-161, 196-202, 240-209, 471-477, 480-485<br><i>Graphing Calculator Lab</i> 162, 197, 210-211, 470, 478-479<br><b>Teacher Wraparound Edition:</b><br>F 473; I 158; Pre-AP 161, 209 |  |

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| <b>NUMERIC AND ALGEBRAIC REPRESENTATIONS</b>  |   |
| 9-10.5.7. Use algebraic expressions, equations, or inequalities involving one or two variables to represent relationships (e.g., given a verbal statement, write an equivalent algebraic expression or equation) found in various contexts (e.g., time and distance problems, mixture problems) | <b>Student Edition:</b><br>70-76, 78-84, 85-90, 92-97, 98-103, 105-110, 111-115, 122-128, 155-161, 187-195, 196-202, 204-209, 213-218, 220-225, 227-233, 253-258, 260-265, 308-313, 315-320<br><i>Reading Mathematics</i> 116 |
| 9-10.5.8. Manipulate algebraic expressions and equations using properties of real numbers; e.g., simplify, factor   | <b>Student Edition:</b><br>21-25, 26-31, 33-37, 70-76, 78-84, 85-90, 92-97, 98-103, 105-110, 111-115, 122-128, 358-364, 366-373, 384-388, 390-395, 398-403, 404-409, 426-431, 434-439   |
| 9-10.5.9. Solve linear equations and inequalities, systems of two linear equations or inequalities, and quadratic equations having rational solutions; e.g., factoring, quadratic formula   | <b>Student Edition:</b><br>78-84, 85-90, 92-97, 98-103, 105-110, 111-115, 122-128, 260-265, 266-270, 272-278, 280-284, 294-299, 301-307, 308-313, 341-345, 426-431, 434-439, 441-446, 486-491, 493-499                        |
| 9-10.5.10. Solve a literal equation for a specified variable; e.g., solve $I = prt$ for $r$ , or solve $7n + p = t$ for $n$   | <b>Student Edition:</b><br>117-121, 155-161, 204-209<br><b>Teacher Wraparound Edition:</b><br><i>Pre-AP</i> 121   |
| <b>MATHEMATICAL MODELING</b>  |   |
| 9-10.5.11. Use essential quantitative relationships in a situation to determine whether the relationship can be modeled by a linear function; e.g., simple interest is linear, compound interest is not linear  | <b>Student Edition:</b><br>155-161, 471-477, 502-508, 510-514<br><i>Graphing Calculator Lab</i> 470, 515-516  |
| 9-10.5.12. Graphically represent the solution or solutions to an equation, inequality, or system  | <b>Student Edition:</b><br>196-202, 204-209, 253-258, 294-299, 315-320, 322-327, 329-333, 334-339, 341-345, 471-477, 480-485, 502-508<br><i>Graphing Calculator Lab</i> 259, 309, 340, 342                                    |
| 9-10.5.13. Interpret a graphical representation of a real-world situation   | <b>Student Edition:</b><br>155-161, 172-176, 187-195, 196-202, 208 #33-38, 227-233, 253-258, 315-320, 334-339, 471-477, 480-485, 502-508<br><i>Algebra Lab</i> 509<br><i>Graphing Calculator Lab</i> 309, 328, 470            |

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| 9-10.5.14. Draw conclusions about a situation being modeled                            | <b>Student Edition:</b><br>17 Ex4, 53-58, 93 Ex3, 95 #29, 102 #33, 122-128, 144 Ex2, 146 #14-17, 153 #39-42, 156 Ex2, 169 #40-43, 172-176, 187-195, 204-209, 213-218, 227-233<br><i>Algebra Lab</i> 59, 228<br><i>Graphing Calculator Lab</i> 203, 234-235 |
| <b>RATES OF CHANGE</b>   |  |
| 9-10.5.15. Approximate and interpret rates of change from graphical and numerical data | <b>Student Edition:</b><br>172-176, 187-195, 196-202, 471-477, 502-508<br><i>Algebra Lab</i> 186, 509<br><i>Graphing Calculator Lab</i> 197, 210-211, 515-516<br><b>Teacher Wraparound Edition:</b><br>Pre-AP 195  |