

GLENCOE CORRELATION
ALGEBRA 1
SOUTH DAKOTA
Mathematics Standards Grades 9-12

STANDARDS	PAGE REFERENCES
GRADES 9-12 ALGEBRA STANDARDS	
1. select, justify, and apply a technique to solve quadratic equations over the set of complex numbers and interpret the results graphically.	SE: 533-535, 536 #7-9, 539-541, 542 #8-13, 543 #47-48, 546-549, 550 #1, 551 #48-49, 552 #51-53 <i>Graphing Calculator Investigation 545</i>
2. analyze the relationships among the coefficients, factors, and roots of polynomials.	SE: 432-434, 458-461, 481-483, 484 #1, 489-492, 495-498, 501-504, 508-511 <i>Algebra Activity 480, 487-488</i>
3. apply commutative, associative, distributive, identity, and inverse properties when combining functions.	SE: 21-23, 26-29, 32-34, 80 #2, 128-131, 135-137, 149-151, 334, 444-445, 452-454
4. use matrices to organize and manipulate data, including matrix addition, subtraction, and scalar multiplication.	SE: 715-717, 718 #12-16, 719 #42-44, 720 #45-48, 721 #53-57, 746
5. analyze various expressions which emphasize the distributive property, e.g., $3(x + 2)$; $(x^3 - 4x^2 + 3x + 1)(x^2 - 2x + 3)$.	SE: 26-29, 33 #3, 150 #2, 334 #4, 444-445, 452-454, 458-461, 481-482 <i>Algebra Activity 451-452, 480</i>
6. explain the logic of algebraic procedures.	SE: 6-7, 11-13, 37-39, 40 #10-12, 41 #47-49, 42 #50, 61, 120-123, 205-207 <i>Reading Mathematics 10</i>
7. extend the concepts of algebra to other types of functions, e.g., trigonometric, exponential, and logarithmic.	SE: 554-557, 558 #9-10, 559 #27-32, 560 #46, 561-563, 564 #18, 565 #25-28, 623-627 <i>Algebra Activity 622</i> <i>Reading Mathematics 566</i>
8. apply recursive formulas to express iterative patterns of change including those of exponential growth and decay, e.g., mortgages, investment returns.	SE: 561-563, 564 #21-22, 565 #25-28, 567-569, 571 #55-60, 572 #69 <i>Algebra Activity 573</i> <i>Reading Mathematics 566</i> <i>Study Tip 234</i>
9. determine roots of polynomial functions including complex roots.	SE: 481-483, 489-492, 493 #17-34, 495-498, 501-503, 508-511, 539-541, 546-549 <i>Algebra Activity 480, 487-488</i>
10. determine equations for lines meeting certain conditions.	SE: 218-220, 240-243, 256-259, 264-267, 272-274, 280-283, 286-288, 298-301 <i>Algebra Activity 271</i> <i>Graphing Calculator Investigation 306-307</i>
11. use inductive reasoning to test and prove that a formula is correct.	SE: 240-242, 243 #1, 245 #34, 298-301 <i>Algebra Activity 416, 573, 783</i> <i>Graphing Calculator Investigation 306-307</i> <i>Reading Mathematics 239</i>
12. explore and develop procedures to identify the real roots of polynomial functions.	SE: 481-483, 489-492, 493 #17-34, 495-498, 501-503, 508-511, 539-541, 546-549 <i>Algebra Activity 480, 487-488</i>

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13. determine the solution of systems of equations in multiple ways.	SE: 369-371, 372 #8-13, 374 #58, 376-378, 381 #39, 382-384, 387-390, 394-396 <i>Graphing Calculator Investigation</i> 375 <i>Spreadsheet Investigation</i> 368
14. solve problems using the quadratic formula including graphic representation and analysis.	SE: 546-549, 550 #4-9, 552 #54, 560 #1-3, 565 #36-38, 576-577, 713 #40-42
15. analyze the binomial theorem.	SE: 452-453, 458-460, 508-509, 518 <i>Algebra Activity</i> 102 <i>Reading Mathematics</i> 507 Note: The term "binomial theorem" is not used explicitly in the text, but it is the basis for the FOIL method of multiplying binomials, factoring perfect square trinomials, and for Pascal's Triangle.
16. solve linear-quadratic and quadratic-quadratic systems of equations algebraically and graphically.	SE: <i>Graphing Calculator Investigation</i> 531-532, 553
17. derive procedures for determining critical features of circles, ellipses, hyperbolas, or parabolas given equations in standard form.	SE: 8 #20, 134 #69-70, 167 #3, 268 #43, 512 #23, 524-526, 601 #50-53, 815-816
18. use matrices to investigate networks and graphs.	SE: 715-717, 721 #53-57
19. create algebraic models to represent problem situations.	SE: 256, 274, 292-293, 539-540, 769-772 <i>Algebra Activity</i> 127, 141, 324, 437-438, 525
20. compare quadratic growth with linear and exponential growth.	SE: 561-563, 564 #21-22, 565 #30, 577 <i>Graphing Calculator Investigation</i> 306-307, 729-730 <i>Reading Mathematics</i> 566
21. explain the graphical impact of the xy term in a quadratic equation.	Note: The quadratic equations used in this text are for figures in standard position and contain no xy terms.
22. graph and interpret complex numbers in vector and polar form.	Material covered in Glencoe <i>Algebra 2</i> 2003 Complex numbers are defined and evaluated. SE: 270-275
23. build formulas representing patterns that are algebraic, trigonometric, logarithmic and exponential.	SE: 240-243, 245 #29-30, 299-301, 303 #24-26, 423 #53, 554-557, 567-569 <i>Algebra Activity</i> 306-307, 622, 729-730
24. find sums, differences, scalar products, dot products, and norms of vectors noting properties which apply.	Material covered in Glencoe <i>Geometry</i> 2004 pages SE: 498-505, 511 #51-#52, 516 #42-#47 TWE: DI 499, OEA 505, TNT 501
25. determine, interpret, and use a unit directional vector, perpendicular components, and norms to express vectors in the coordinate plane.	Material covered in Glencoe <i>Geometry</i> 2004 pages SE: 498-505, 511 #51-#52, 516 #42-#47 TWE: DI 499 OEA 505 TNT 501
GRADES 9-12 GEOMETRY STANDARDS	
1. know, use, derive formulas for, and solve problems involving perimeter, circumference, area, volume, lateral area, and surface area of common geometric figures.	SE: 8 #20, 9 #44, 134 #69-70, 454 #3, 456 #43-44, 596 #39-40, 605-607, 813-817 <i>Algebra Activity</i> 122, 416

STANDARDS	PAGE REFERENCES
2. prove the properties of geometric figures using algebraic and deductive proofs.	SE: 292-295, 605-607, 609 #48, 616-618, 635-636, 813-817 <i>Algebra Activity</i> 122, 416
3. justify conjectures pertaining to geometric figures.	SE: <i>Algebra Activity</i> 122, 293, 416, 501, 525, 622
4. use given information to deduce properties of and relationship between figures.	SE: 292-295, 605-607, 609 #48, 616-618, 635-636, 813-817 <i>Algebra Activity</i> 122, 416
5. explore and analyze the properties of triangles.	SE: 605-607, 609 #48, 616-618, 623-625, 634-636 <i>Algebra Activity</i> 622, 626
6. investigate and identify congruence and similarity relationships among triangles.	SE: 616-618, 619 #25, 635, 810-811
7. determine the values of the six trigonometric functions of angles in standard position.	SE: 623-625, 636 <i>Algebra Activity</i> 622
8. investigate and use properties of angles, arcs, chords, tangents, and secants to solve problems.	SE: 457 #63-64, 647 #43-45
9. identify, create, and solve practical problems involving triangles and vectors.	SE: 609 #45-47, 610 #50, 618 Ex#3, 619 #28, 620 #31-32, 629 #61-62, 630 #63-64 <i>Algebra Activity</i> 626
10. build three-dimensional figures from two-dimensional shapes or drawings.	SE: 812
11. draw two-dimensional drawings of three-dimensional objects from various perspectives.	SE: 462 #45-46, 812
12. build three-dimensional objects to scale.	SE: 261 #57, 349 #13, 442 #36-40, 456 #53, 609 #46-47
13. use matrices to translate, reflect, rotate, or scale polygonal figures represented on the coordinate plane.	SE: 197-200, 717 #4
14. use graphing tools to study transformations, e.g., congruence using rigid motion, similarity using magnification of images.	SE: 197-200, 201 #9-10, 202 #27-29, 203 #44-46
15. select transformations required to map images of objects.	SE: 197-200, 201 #17-26, 202 #27-29, 203 #44-46
16. use proportional reasoning to solve practical problems.	SE: 155-157, 158 #17, 159 #33, 163 #46-47, <i>Reading Mathematics</i> 165
17. identify, create, and solve practical problems using a system of vectors and their horizontal and vertical components.	Material covered in Glencoe <i>Geometry</i> 2004 pages SE: 498-505, 511 #51-#52, 516 #35-#41, 517 #22-#23 TWE: DI 499 OEA 505
18. represent situations using the properties of coordinate geometry to answer pertinent questions.	SE: 192-194, 195 #39-43, 206 #2, 282, 290 #58-60, 533-535, 611-613, 614 #40-42 <i>Algebra Activity</i> 293, 525
GRADES 9-12 MEASUREMENT STANDARDS	
1. investigate and explain the relationships between linear, square, and cubic measures and describe how changes in one of the measures of an object affect the others.	SE: 124 #23-26, 125 #41-44, 126 #52, 169 #41, 414 #43-48, 456 #43-44 <i>Algebra Activity</i> 122, 416

STANDARDS	PAGE REFERENCES
2. analyze unit combinations to check answers, e.g., feet per second.	SE: 167 #4, 169 #38-39, 176 #30-31, 258-259, 445 #3, 505 #49, 562 #3, 592 #69, 596 #45
3. use quotient measures and relate them to slope, e.g., speed, density.	SE: 258 #6, 261 #57, 266 #5, 269 #48-51, 274 #5, 290 #58-60, 300-301 <i>Algebra Activity 271</i>
4. derive and use formulas for solving problems involving measurements.	SE: 124 #21-22, 125 #48-51, 131 Ex#6, 132 #51-55, 136 #4, 139 #46-49, 146 #48, 618 Ex#3, 620 #31-32 <i>Algebra Activity 122</i>
5. develop units or combinations of units for a given situation or application.	SE: 167 #4, 169 #38-39, 176 #30-31, 258-259, 445 #3, 505 #49, 562 #3, 592 #69, 596 #45
6. create tools or application processes to solve problems that defy direct measurement.	SE: 565 #25-28, 591 #45-47, 618 Ex#3, 620 #31-32, 623, 629 #61-62, 630 #63-64 <i>Algebra Activity 626, 783</i>
7. use the concept of significant digits in giving answers to an appropriate degree of accuracy.	Material covered in Glencoe <i>Geometry</i> 2004 pages SE: 13-19 TWE: DI 14 OEA 19
8. create tools or application processes to improve accuracy or minimize error in measurement situations.	SE: 708-709, 713 #32 <i>Reading Mathematics 714</i>
9. analyze specific measurement situations to determine necessary degree of accuracy and/or allowable error tolerance.	SE: 349 #13, 350 #48-49, 351 #53 <i>Algebra Activity 347</i>
10. identify the structural parts and characteristics of objects to answer questions about them, e.g., a penny can be seen as a cylinder with a small height so its volume is $V = \pi r^2 h$.	SE: 6, 256, 260 #35-36, 261 #57, 616-618 <i>Algebra Activity 626</i>
11. solve measurement problems involving perimeter, area, volume, and mass of irregularly-shaped objects.	SE: 433 #2, 434 #14, 435 #21-24, 447 #37-38, 455 #41, 456 #44, 485 #44-45, 652 #53-54
GRADES 9-12 NUMBER SENSE STANDARDS	
1. describe the structure of the real number system and related subsets.	SE: 68-69, 70 #17, 103-106, 107 #2, 108 #73
2. apply properties and axioms of the real number system to various subsets, e.g., axioms of order, closure.	SE: 11-13, 14 #38-39, 17 #2, 21-23, 25 #41-43, 26-29, 32-34, 58-60, 140 #67-68
3. understand that real numbers can be represented in a variety of forms, e.g., integers, fractions, decimals, percents, scientific notation, exponents, radicals, absolute value, logarithms.	SE: 15 #64-71, 68-70, 144, 160-161, 425-427, 428 #30-41, 554-557, 586-589, 776 #67-75, 798-801
4. describe the relationship of the real number system to the complex number system.	Material covered in Glencoe <i>Algebra 2</i> 2003 pages SE: 11-18, 270-275 TWE: ICE 12, 270-273
5. explain the meaning of the number e .	Material covered in Glencoe <i>Algebra 2</i> 2003 pages SE: 554-559 TWE: TT 555
6. add, subtract, multiply, and divide algebraic expressions.	SE: 318-320, 325-328, 332-334, 359-360, 382-384, 387-390, 410-412, 417-420, 444-445, 458-459

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7. evaluate algebraic expressions.	SE: 11-13, 14 #32-39, 15 #48-50, 16-18, 19 #37-44, 20 #51, 26-29, 31 #66-69, 32-34, 36 #62-66
8. add, subtract, multiply, and divide real numbers including roots and exponents using appropriate computational strategies, e.g., mental mathematics, paper and pencil, calculator.	SE: 27 #4, 73-75, 76 #4-15, 79-80, 81 #4-9, 82 #51, 84-85, 87 #60, 587 #2 <i>Graphing Calculator Investigation</i> 556
9. explain the effects of arithmetic operations on real numbers, e.g., roots, exponents, and inverse relationships.	SE: 69 #3, 103-104, 107 #4-7, 108 #50, 114, 206-207, 209 #26-28, 217 #56-58 <i>Reading Mathematics</i> 566
10. analyze and describe fractional exponents, e.g., $10^{3/4}$.	SE: 555, 558 #13-18, 592 #56-61
11. analyze the decimal representation of numbers, e.g., $1/3 = .33333 \dots$, $.010010001\dots$	SE: 776 #67-75, 804
12. add, subtract, multiply, divide, and simplify expressions containing fractional exponents.	SE: 555, 558 #13-18, 592 #56-61
13. use estimation strategies in complex situations to predict results and to check the reasonableness of results.	SE: 17 #4, 108 #51, 147 #51-52, 535, 536 #7-9, 538 #51-52 <i>Algebra Activity</i> 49 TWE: DI 370 TNT 106
14. select and justify alternative strategies, e.g., use properties of numbers that allow operational shortcuts for computational procedures.	SE: 458-461 <i>Study Tip</i> 137, 378, 389, 419, 476, 491, 503, 510 TWE: TNT 106
15. apply properties of arithmetic and geometric sequences and series to solve problems, e.g., write the first n terms, find the nth term, evaluate summation formulas.	SE: 233-235, 236 #8-11, 237 #27-36, 567-570, 571 #25-30, 572 #66-68, 592 #62-67, 653 #70-73 <i>Spreadsheet Investigation</i> 232
16. use logic strategies to develop and defend mathematical arguments.	SE: 37-39, 40 #7-9, 41 #47-49, 42 #50, 712 #29 <i>Reading Mathematics</i> 714 TWE: DI 15, 144, 370
17. understand and use basic concepts of infinity and limits.	SE: 571 #60, 572 #66-68 <i>Study Tip</i> 68
18. compare, contrast, and extend arithmetic and geometric patterns of growth and use them to make predictions about events for which there is no data.	SE: 233-235, 237 #50-53, 240-243, 567-570, 571 #58-60, 592 #68 <i>Algebra Activity</i> 299 <i>Reading Mathematics</i> 239, 566 <i>Spreadsheet Investigation</i> 232
19. understand the relative size of sets of rational numbers and irrational numbers.	SE: 104 <i>Study Tip</i> 68 Note: Both sets are infinite, but to mathematicians, they differ in "size." Rational numbers are "countably infinite" and irrational numbers are "uncountably infinite."

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20. describe impact of powers on products and quotients.	SE: 7, 410-412, 417-420, 421 #4-12, 422 #43-44, 423 #52
21. apply operations to numbers expressed in scientific notation.	SE: 425-427, 428 #12-15, 429 #56, 430 #64-67, 465-467, 469 #16-18
GRADES 9-12 PATTERNS, RELATIONS, AND FUNCTIONS STANDARDS	
1. use various representations of functions, e.g., graphs, tables, symbolic forms.	SE: 43-45, 46 #6-8, 47 #17-19, 48 #24, 226-228, 229 #4-9, 230 #49-51, 524-527 <i>Algebra Activity 49</i> <i>Graphing Calculator Investigation 224-225</i>
2. analyze direct and inverse relations to determine their characteristic patterns.	SE: 205-207, 209 #26-28, 212-214, 217 #56-58, 226-228, 240-243, 247-248, <i>Graphing Calculator Investigation 204</i> <i>Reading Mathematics 239</i> <i>Spreadsheet Investigation 232</i>
3. apply transformations to the graph of a basic function and predict and analyze the results.	SE: 197-200, 201 #17-21, 202 #27-29, 203 #44-46, 247, 415 #71-73, 559 #42-44 <i>Graphing Calculator Investigation 556</i>
4. determine the domain, range, zeros, y-intercepts, end behavior, relative maximum and minimum points, and symmetry of functions.	SE: 43-45, 48 #24, 226-228, 230 #49-51, 524-527, 529 #37, 530 #54-59, 533-535, 554-557, 558 #4-6, 559 #33-35
5. demonstrate and explain the effect that changing coefficients and/or constants has on the graph of a function.	SE: 369-371, 524-527 <i>Algebra Activity 569</i> <i>Graphing Calculator Investigation 265, 278-279, 375, 531-532, 556, 604</i>
6. use a graph of a function to find the graph of the inverse function.	SE: 206-207, 210 #53-56, 217 #56-58, 251 #8-10 TWE: OEA 211
7. determine the restrictions that must be placed on the domain and range of a relation for it to be a function.	SE: 43-45, 226-228, 229 #4-9
8. create tables or graphs to interpret relations and/or functions.	SE: 43-45, 192-193, 205-207, 272-274, 369-371 <i>Algebra Activity 49, 271</i> <i>Graphing Calculator Investigation 204, 375</i> <i>Spreadsheet Investigation 56</i>
9. create geometric and numerical patterns that model relations and/or functions.	SE: 233-235, 237 #50-53, 240-243, 565 #25-28, 567-569, 571 #55, 652 #53-54 <i>Algebra Activity 573</i> <i>Reading Mathematics 566</i>
10. determine which type of function best models a situation, write an equation, and use this equation to answer questions about the situation.	SE: 256-259, 260 #35-36, 261 #57, 262 #58, 274, 445 #3, 612 Ex#2, 614 #40-42, 618 Ex#3, 629 #61-62
11. use laws of logarithms to simplify expressions and solve equations involving logarithms and exponents.	Material covered in Glencoe <i>Algebra 2</i> 2003 pages SE: 526-530, 531-537, 541-546, 547-551, 554-559 TWE: ICE 526, 532-534, 542-543, 548-549 OEA 538
12. analyze the relationship between exponential and logarithmic functions.	Material covered in Glencoe <i>Algebra 2</i> 2003 pages SE: 531-537 TWE: ICE 532
13. graph various parametric polar equations.	Material covered in <i>Advanced Mathematical Concepts</i> © 2004 on pages 561-567.

STANDARDS	PAGE REFERENCES
14. identify natural phenomena that are cyclic.	SE: 602 #54-56
15. apply special number relationships, e.g., sequences and series to real-world problems.	SE: 236 #14, 237 #50-53, 238 #53, 245 #34, 565 #25-28, 568 #3, 571 #58-60 <i>Algebra Activity 573</i> <i>Reading Mathematics 566</i>
16. compare, contrast, and extend arithmetic and geometric patterns of growth and use them to make predictions.	SE: 233-235, 238 #59, 568 #3, <i>Algebra Activity 241</i> <i>Reading Mathematics 566</i>
17. determine and use recursive formulas to express iterative patterns of change including those of exponential growth and decay.	SE: 237 #50-53, 561-563, 564 #21-22, 565 #25-28, 568 #3, 571 #58-60 <i>Reading Mathematics 566</i> <i>Study Tip 234</i>
18. use concepts of infinity and limits to solve problems.	SE: 572 #66-68
19. use successive approximation techniques to solve problems.	SE: <i>Graphing Calculator Investigation 306-307</i>
20. apply limits of geometric series to problem situations.	SE: 572 #66-68
21. use iteration and recursion to evaluate problem situations.	SE: 234-235, 237 #50-53, 561-563, 564 #21-22, 565 #25-28, 568 #3, 571 #58-60 <i>Reading Mathematics 566</i>
22. solve equations that include both infinite solutions and restricted domain solutions.	SE: 572 #66-68
23. estimate the limit of a given infinite sequence.	SE: 572 #66-68
GRADES 9-12 STATISTICS & PROBABILITY STANDARDS	
1. analyze and evaluate surveys and experiments conducted by others, e.g., bias, randomness, analysis, interpretation.	SE: 50-52, 53 #4-5, 54 #16, 55 #17, 88-91, 711 #8-12, 777-778 <i>Algebra Activity 783</i> <i>Reading Mathematics 95, 714</i>
2. create, implement, and defend a plan for gathering data to answer relevant questions.	SE: 708-710, 712 #27 <i>Reading Mathematics 714</i>
3. compare multiple one-variable data sets, using statistical techniques including measures of central tendency and dispersion.	SE: 88-91, 93 #34
4. calculate measures of central tendency and dispersion for complex sets of data.	SE: 90-91, 92 #19, 731-733, 741 #30-31
5. demonstrate how statistical analysis can quantify variability.	SE: 731-733, 734 #6-10, 735 #29-33, 737-739, 740 #8-9, 741 #30-31, 747-748
6. describe the normal curve and use it to predict percentiles and probabilities.	SE: 743-744
7. use scatterplots, regression lines, and correlation coefficients to model data and support conclusions.	SE: 298-301, 302 #10-13, 303 #19-23, 312 <i>Graphing Calculator Investigation 306-307, 729-730</i>
8. determine probabilities using counting procedures, tables, tree diagrams, and formulas for permutations and combinations.	SE: 100 #54-56, 754-756, 757 #18-19, 760-763, 764 #10-12, 765 #36-39, 777-778
9. determine probability of compound, complementary, independent, and dependent events.	SE: 422 #43-44, 436 #71, 597 #70, 769-772, 774 #32-34
10. evaluate effectiveness and accuracy of the model in respect to the theoretical probability.	SE: 782-784, 792

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11. design, implement, and interpret simulations to estimate probabilities of events.	SE: 782-784, 785 #9-12, 786 #25-27, 787 #36-38, 792
12. determine probability using given graphs of distributions or table of outcomes.	SE: 96-98, 298-301, 303 #16-17, 777-778 <i>Algebra Activity 102</i>
13. predict outcomes of simple and compound events using given theoretical probabilities.	SE: 96-98, 769-772, 774 #32-34, 782-784, 785 #9-12
14. determine whether experimental or theoretical methods were used to calculate a particular probability.	SE: 782-784, 785 #9-12, 786 #25-27
15. use combinations, permutations, and probabilities to solve problems.	SE: 760-763, 764 #10-12, 765 #36-39, 766 #52-54, 785 #9-12, 790

Codes Used for TWE Pages

DI Differentiated Instruction
OEA Open Ended Assessment
TNT Tips for New Teachers