

GLENCOE CORRELATION
ALGEBRA 2
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: 294-299, 313-319 TWE: ICE 295, 314-316 OEA 299
2. analyze the relationships among the coefficients, factors, and roots of polynomials.	SE: 361, 367, 371-377, 378-382 TWE: ICE 361, 367, 372-374
3. apply commutative, associative, distributive, identity, and inverse properties when combining functions.	SE: 383-389, 390-394 TWE: ICE 392
4. use matrices to organize and manipulate data, including matrix addition, subtraction, and scalar multiplication.	SE: 154-158, 160-166, 167-173, 175-181 TWE: H 167 ICE 155, 161-163, 168-170, 176-178
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: 14-16, 22, 230-232, 253-254 <i>Algebra Activity 13</i> <i>Getting Ready for the Next Lesson 228</i> <i>Getting Started 221</i> TWE: ICE 14, 230, 253
6. explain the logic of algebraic procedures.	SE: <i>Check for Understanding 476</i> <i>Critical Thinking 17, 227</i> <i>Find the Error 24, 43, 226, 303, 310, 325, 509</i>
7. extend the concepts of algebra to other types of functions, e.g., trigonometric, exponential, and logarithmic.	SE: 523-530, 531-537, 541-546, 739-745, 762-768 <i>Algebra Activity 522</i> TWE: ICE 524-525, 532-534, 542-543, 765-766
8. apply recursive formulas to express iterative patterns of change including those of exponential growth and decay, e.g., mortgages, investment returns.	SE: 606-611 TWE: ICE 607-608
9. determine roots of polynomial functions including complex roots.	SE: 360-364, 365-370, 371-377, 378-382 TWE: ICE 361, 367, 372-373, 379 OEA 382
10. determine equations for lines meeting certain conditions.	SE: 75-80 TWE: ICE 76-77
11. use inductive reasoning to test and prove that a formula is correct.	SE: <i>Algebra Activity 19, 83, 522, 607, 716</i>
12. explore and develop procedures to identify the real roots of polynomial functions.	SE: 348-352, 353-358, 360-364, 365-370, 371-377 TWE: ICE 349, 354, 361, 367, 372
13. determine the solution of systems of equations in multiple ways.	SE: 110-115, 116-122, 138-144, 189-194, 202-207 <i>Graphing Calculator Investigation 208</i> TWE: ICE 111-112, 116-119, 139-141, 190-191

STANDARDS	PAGE REFERENCES
14. solve problems using the quadratic formula including graphic representation and analysis.	SE: 313-319, 331-333, 373-376 <i>Getting Ready for the Next Lesson</i> 370 <i>Getting Started</i> 345 TWE: ICE 314-316, 331, 373
15. analyze the binomial theorem.	SE: 612-617 TWE: ICE 613-615
16. solve linear-quadratic and quadratic-quadratic systems of equations algebraically and graphically.	SE: 455-460 TWE: ICE 456
17. derive procedures for determining critical features of circles, ellipses, hyperbolas, or parabolas given equations in standard form.	SE: 419-425, 426-431, 433-440, 441-447, 449-452 TWE: ICE 420, 428, 436, 443-444
18. use matrices to investigate networks and graphs.	SE: 175-181 TWE: ICE 176-178
19. create algebraic models to represent problem situations.	SE: 81-86 <i>Algebra Activity</i> 13, 240, 252, 272, 308 <i>Graphing Calculator Investigation</i> 300, 359, 539-540 TWE: ICE 82
20. compare quadratic growth with linear and exponential growth.	SE: 286-293, 348-349, 523-530
21. explain the graphical impact of the xy term in a quadratic equation.	Quadratic equations are graphed and evaluated. SE: 286-293, 294-299, 322-327 <i>Graphing Calculator Investigation</i> 320-321
22. graph and interpret complex numbers in vector and polar form.	Complex numbers are defined and evaluated. SE: 270-275
23. build formulas representing patterns that are algebraic, trigonometric, logarithmic and exponential.	SE: 531-537, 541-546, 717-724, 725-732, 733-738
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: 8-10, 184-187, 379-381, 725-732 TWE: ICE 8, 185, 379, 726
2. prove the properties of geometric figures using algebraic and deductive proofs.	Material covered in Glencoe <i>Geometry</i> © 2004 pages SE: 101-106, 107-114 TWE: OEA 106, 114

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3. justify conjectures pertaining to geometric figures.	SE: <i>Prerequisite Skills</i> 817-819
4. use given information to deduce properties of and relationship between figures.	SE: <i>Prerequisite Skills</i> 817-819
5. explore and analyze the properties of triangles.	SE: 702-708, 725-732, 733-738 <i>Getting Started</i> 699
6. investigate and identify congruence and similarity relationships among triangles.	SE: <i>Prerequisite Skills</i> 817-819
7. determine the values of the six trigonometric functions of angles in standard position.	SE: 701-708, 717-724, 740-745, 762-768 TWE: ICE 702-705, 718-721, 740
8. investigate and use properties of angles, arcs, chords, tangents, and secants to solve problems.	Equations and graphs of circles are evaluated. SE: 426-431 TWE: ICE 427
9. identify, create, and solve practical problems involving triangles and vectors.	SE: 705-708, 729-732, 735-738 <i>Prerequisite Skills</i> 819, 821 TWE: ICE 705, 729, 735 OEA 708
10. build three-dimensional figures from two-dimensional shapes or drawings.	Material covered in Glencoe <i>Geometry</i> © 2004 pages SE: 639 #4, 640 #9-#12, 645 #8, 646 #25-#27, 647 #39, 648 #41, 654 #47-#48, 659 #35-#36 TWE: DI 644
11. draw two-dimensional drawings of three-dimensional objects from various perspectives.	Material covered in Glencoe <i>Geometry</i> © 2004 pages SE: 636-637 ex 1, 639 #4, 640 #13-#15, 643 ex 1, 644 ex 2, 645 #5-#7, 646 #15-#23, 647 #35, 654 #44-#46, 679 #14-#19
12. build three-dimensional objects to scale.	Material covered in Glencoe <i>Geometry</i> © 2004 pages SE: 707-713 TWE: H 707
13. use matrices to translate, reflect, rotate, or scale polygonal figures represented on the coordinate plane.	SE: 175-181 TWE: ICE 176-178
14. use graphing tools to study transformations, e.g., congruence using rigid motion, similarity using magnification of images.	SE: 175-181 TWE: ICE 176-177
15. select transformations required to map images of objects.	SE: 178-179
16. use proportional reasoning to solve practical problems.	SE: <i>Getting Started</i> 471 <i>Prerequisite Skills</i> 817-819
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

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18. represent situations using the properties of coordinate geometry to answer pertinent questions.	Material covered in Glencoe <i>Geometry</i> © 2004 pages SE: 21-27, 36 #52-#54, 43 #50-#55, 47 ex 3, 55 #20-#27, 139-144, 154 #11, 169 #23-#26
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.	Material covered in Glencoe <i>Algebra 1</i> 2003 pages SE: 124 #23-26, 125 #41-44, 126 #52, 169 #41, 414 #43-48, 456 #43-44 <i>Algebra Activity</i> 122, 416
2. analyze unit combinations to check answers, e.g., feet per second.	Material covered in Glencoe <i>Algebra 1</i> 2003 pages 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.	Slope is found using the slope formula. SE: 68-74 TWE: ICE 69
4. derive and use formulas for solving problems involving measurements.	SE: 8-10, 184-187, 412-416, 702-708, 725-732 <i>Algebra Activity</i> 417-418 <i>Getting Started</i> 699 <i>Prerequisite Skills</i> 820-821 TWE: ICE 413, 703
5. develop units or combinations of units for a given situation or application.	Material covered in Glencoe <i>Algebra 1</i> 2003 pages 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: 412-416, 701-708, 725-732, 733-738 <i>Prerequisite Skills</i> 820-821 TWE: ICE 413, 703-705, 726-729, 734-735
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: 412-416, 701-708, 725-732, 733-738 <i>Prerequisite Skills</i> 820-821 TWE: ICE 413, 703-705, 726-729, 734-735
9. analyze specific measurement situations to determine necessary degree of accuracy and/or allowable error tolerance.	SE: 412-416, 701-708, 725-732, 733-738 <i>Algebra Activity</i> 417-418 <i>Prerequisite Skills</i> 820-821 TWE: ICE 413, 703-705, 726-729 TT 413
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: 26 #70, 711-713
11. solve measurement problems involving perimeter, area, volume, and mass of irregularly-shaped objects.	SE: 187 #41
GRADES 9-12 NUMBER SENSE STANDARDS	
1. describe the structure of the real number system and related subsets.	SE: 11-18 TWE: ICE 12 OEA 18
2. apply properties and axioms of the real number system to various subsets, e.g., axioms of order, closure.	SE: 11-18, 20-27, 301-305 TWE: ICE 12-14, 21-23, 302 OEA 305

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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: 225-228, 245-249, 257-262 <i>Prerequisite Skills</i> 814 TWE: ICE 225, 246-247, 251-253, 258-260
4. describe the relationship of the real number system to the complex number system.	SE: 11-18, 270-275 TWE: ICE 12, 270-273
5. explain the meaning of the number e .	SE: 554-559 TWE: TT 555
6. add, subtract, multiply, and divide algebraic expressions.	SE: 14-16, 222-227, 229-232, 233-238 TWE: ICE 14, 222, 230, 233-235
7. evaluate algebraic expressions.	SE: 6-10, 28-30 <i>Getting Ready for the Next Lesson</i> 18 <i>Getting Started</i> 55, 109 <i>Mixed Review</i> 27 TWE: ICE 7, 29
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: 6-10, 160-166, 167-173, 250-255 <i>Getting Started</i> 5 TWE: ICE 7-8, 161-163, 168-170, 251-253
9. explain the effects of arithmetic operations on real numbers, e.g., roots, exponents, and inverse relationships.	SE: <i>Check for Understanding</i> 14, 260
10. analyze and describe fractional exponents, e.g., $10^{3/4}$.	SE: 257-262 TWE: ICE 258-260
11. analyze the decimal representation of numbers, e.g., $1/3 = .33333 \dots$, $.010010001\dots$	SE: <i>Prerequisite Skills</i> 814
12. add, subtract, multiply, divide, and simplify expressions containing fractional exponents.	SE: 259-262 TWE: ICE 259
13. use estimation strategies in complex situations to predict results and to check the reasonableness of results.	SE: 296-299, 307, 315 TWE: ICE 296
14. select and justify alternative strategies, e.g., use properties of numbers that allow operational shortcuts for computational procedures.	SE: 223-228, 313-319, 322-327, 365-370, 378-382, 769-776 TWE: ICE 223-225, 323-324, 366-367, 379
15. apply properties of arithmetic and geometric sequences and series to solve problems, e.g., write the first n terms, find the n th term, evaluate summation formulas.	SE: 578-582, 583-587, 588-592, 594-598 TWE: H 583, 594 ICE 579-580, 584-585, 589-590, 595-596
16. use logic strategies to develop and defend mathematical arguments.	SE: <i>Algebra Activity</i> 19, 83, 240, 432, 522, 607, 681, 686, 716
17. understand and use basic concepts of infinity and limits.	SE: 599-603 <i>Graphing Calculator Investigation</i> 593
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: 578-582, 588-592, 606-610 <i>Algebra Activity</i> 611 TWE: H 606 ICE 607

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19. understand the relative size of sets of rational numbers and irrational numbers.	SE: 11-18 TWE: ICE 12
20. describe impact of powers on products and quotients.	SE: 222-228 TWE: ICE 224-225
21. apply operations to numbers expressed in scientific notation.	SE: 225-227 <i>Extra Practice</i> 836 TWE: ICE 225
GRADES 9-12 PATTERNS, RELATIONS, AND FUNCTIONS STANDARDS	
1. use various representations of functions, e.g., graphs, tables, symbolic forms.	SE: 56-62, 63-67, 89-94, 110-115, 286-293, 353-358 TWE: ICE 58-59, 65, 90-92, 111-112
2. analyze direct and inverse relations to determine their characteristic patterns.	SE: 390-394 TWE: ICE 391-392
3. apply transformations to the graph of a basic function and predict and analyze the results.	SE: 91, 322-326, 769-776 <i>Graphing Calculator Investigation</i> 70, 320-321, 764 TWE: ICE 91, 323-325, 770-773
4. determine the domain, range, zeros, y-intercepts, end behavior, relative maximum and minimum points, and symmetry of functions.	SE: 89-95, 286-293, 294-299, 322-327, 397-399, 523-528 TWE: ICE 91-92, 287-289, 295, 524
5. demonstrate and explain the effect that changing coefficients and/or constants has on the graph of a function.	SE: 91, 322-326, 769-776 <i>Graphing Calculator Investigation</i> 70, 320-321, 764 TWE: ICE 91, 323-324, 770-773
6. use a graph of a function to find the graph of the inverse function.	SE: 390-394, 395, 746-747 TWE: ICE 391
7. determine the restrictions that must be placed on the domain and range of a relation for it to be a function.	SE: 395-399, 746-749 TWE: ICE 396
8. create tables or graphs to interpret relations and/or functions.	SE: 56-62, 89-94, 129-134, 294-299, 353-358 TWE: ICE 58-59, 90-92, 130-131, 295-296, 354-355
9. create geometric and numerical patterns that model relations and/or functions.	SE: 58-62, 89-94, 578-582, 588-592, 599-603 TWE: ICE 579 OEA 604
10. determine which type of function best models a situation, write an equation, and use this equation to answer questions about the situation.	SE: 89-95 TWE: H 89 ICE 90
11. use laws of logarithms to simplify expressions and solve equations involving logarithms and exponents.	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.	SE: 531-537 TWE: ICE 532
13. graph various parametric polar equations.	Material covered in <i>Glencoe Advanced Mathematical Concepts</i> © 2004 on pages 561-567.
14. identify natural phenomena that are cyclic.	SE: 739-745, 762-768

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15. apply special number relationships, e.g., sequences and series to real-world problems.	SE: 578-582, 583-587, 588-592, 594-597, 606-610 TWE: H 583, 594 ICE 584, 607
16. compare, contrast, and extend arithmetic and geometric patterns of growth and use them to make predictions.	SE: 560-564, 578-581, 588-592 TWE: H 578 ICE 561-562
17. determine and use recursive formulas to express iterative patterns of change including those of exponential growth and decay.	SE: 606-611 TWE: ICE 607-608
18. use concepts of infinity and limits to solve problems.	SE: 599-603 <i>Graphing Calculator Investigation 593</i> TWE: ICE 600-601
19. use successive approximation techniques to solve problems.	SE: 599
20. apply limits of geometric series to problem situations.	SE: 599-605 <i>Graphing Calculator Investigation 593</i> TWE: ICE 600-601
21. use iteration and recursion to evaluate problem situations.	SE: 606-610 TWE: ICE 607-608
22. solve equations that include both infinite solutions and restricted domain solutions.	SE: 29-31, 40-46, 110-113, 263-267 TWE: ICE 29
23. estimate the limit of a given infinite sequence.	SE: 599-603 TWE: ICE 600-601
GRADES 9-12 STATISTICS & PROBABILITY STANDARDS	
1. analyze and evaluate surveys and experiments conducted by others, e.g., bias, randomness, analysis, interpretation.	SE: 682-685 TWE: ICE 683
2. create, implement, and defend a plan for gathering data to answer relevant questions.	SE: <i>Algebra Activity 522</i>
3. compare multiple one-variable data sets, using statistical techniques including measures of central tendency and dispersion.	Measure of central tendency is found for various data sets. SE: 664-669 TWE: ICE 665
4. calculate measures of central tendency and dispersion for complex sets of data.	SE: 664-669 <i>Prerequisite Skills 822-823</i> TWE: ICE 665
5. demonstrate how statistical analysis can quantify variability.	SE: 664-669 TWE: ICE 665
6. describe the normal curve and use it to predict percentiles and probabilities.	SE: 671-675 TWE: ICE 672
7. use scatterplots, regression lines, and correlation coefficients to model data and support conclusions.	SE: 81-86 <i>Graphing Calculator Investigation 87-88</i> TWE: ICE 82-83
8. determine probabilities using counting procedures, tables, tree diagrams, and formulas for permutations and combinations.	SE: 632-636, 638-642, 644-649 TWE: ICE 633-634, 639-640, 645-646 OEA 643
9. determine probability of compound, complementary, independent, and dependent events.	SE: 632-636, 638-642, 644-649 TWE: H 632, 644 ICE 633-634, 639-640 OEA 650

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10. evaluate effectiveness and accuracy of the model in respect to the theoretical probability.	SE: 644-649, 652 <i>Algebra Activity 651</i>
11. design, implement, and interpret simulations to estimate probabilities of events.	A simulation is conducted. SE: <i>Algebra Activity 681</i>
12. determine probability using given graphs of distributions or table of outcomes.	SE: 671-675 TWE: ICE 672
13. predict outcomes of simple and compound events using given theoretical probabilities.	SE: 644-649, 651-657, 658-662 TWE: ICE 645-646, 652-654, 659-660 OEA 650, 657
14. determine whether experimental or theoretical methods were used to calculate a particular probability.	SE: <i>Extending the Lesson 649</i>
15. use combinations, permutations, and probabilities to solve problems.	SE: 638-642, 644-649 TWE: H 644 ICE 639-640, 645-646 OEA 650

Codes Used for TWE Pages

H	How
ICE	In-Class Examples
OEA	Open-Ended Assessment
TT	Teaching Tip