Cord Geometry, Learning in Context, 3rd edition and *Cord Algebra 2, Learning in Context, 1st edition* correlation to North Carolina High School Math Level BC Essential Standards

Essential Standard	**Cord Geometry Lesson(s)**	**Cord Algebra 2 Lesson(s)**
N.BC.1 **Operate and solve problems involving rational exponents.**		
N.BC.1.a Translate between writing numbers with rational powers, limited to exponents in the form 1/n, and express them using roots.		5.3
N.BC.1.b Simplify algebraic expressions containing roots or rational powers of the form 1/n.		5.3
N.BC.1.c Understand, operate with, and solve problems in context with rational and irrational solutions.	Used throughout especially in Math Applications sections	Used throughout especially 5.4, 6.6 and Math Applications sections
N.BC.2 **Use and perform operations with matrices.**		
N.BC.2.a Represent numerical and relational data characterized with two or more variables using matrices.		3.1
N.BC.2.b Solve problems involving addition, subtraction, and scalar multiplication of matrices.		3.1
N.BC.2.c Investigate the properties of matrix multiplication and multiply matrices to solve problems in context.		3.2, 3.3, 3.4
A.BC.1 **Represent and interpret functions based on mathematical and real-world phenomena.**		
A.BC.1.a Model absolute value, step and piecewise linear functions, and quadratic functions.		4.4
A.BC.1.b Solve equations graphically and numerically (using tables).		1.2, 1.3, 1.4, 1.5, 5.4, 6.1
A.BC.2 **Solve systems of equations and inequalities and interpret their solutions.**		
A.BC.2.a Solve systems of linear equations using matrices.		3.5

A.BC.2.b Solve systems of combinations of equations or inequalities (linear, absolute value and quadratic).		7.7
A.BC.3 **Transform families of functions.**		
A.BC.3.a Transform absolute value, quadratic and exponential functions in a coordinate plane. • horizontal and vertical translations • reflections across the x-axis, y-axis, origin, and other vertical and horizontal lines • dilations (enlargement and reduction in size)		4.5
A.BC.4 **Perform algebraic operations with rational expressions.**		
A.BC.4.a Add, subtract, multiply, and divide rational expressions.		10.2, 10.3
A.BC.4.b Simplify rational expressions.		10.2, 10.3
A.BC.5 **Apply properties of logarithms.**		
A.BC.5.a Use properties to convert between exponential and logarithmic form for positive integerbase logarithms.		8.2
A.BC.5.b Evaluate logarithms.		8.2, 8.3, 8.4
A.BC.5.c Use logarithmic properties to simplify algebraic expressions and prove theorems.		8.3, 8.4
A.BC.6 **Use appropriate properties and strategies to solve linear, quadratic, exponential, logarithmic, and rational equations in context.**		
A.BC.6.a Solve quadratic equations with real coefficients: • using graphs and tables • by factoring, with and without technology • using the quadratic formula to include complex roots • solve with and without technology and interpret the solutions in context		6.1, 6.2, 6.3, 6.4, 6.5, 6.6

A.BC.6.b Simplify and solve rational equations with linear and quadratic denominators, identifying restrictions.		10.4
A.BC.6.c Apply properties to solve exponential and logarithmic equations symbolically, numerically, and graphically.		8.5
A.BC.7 **Operate with functions and their inverses.**		
A.BC.7.a Using function notation, find the sum, difference, product, and quotient of two or more functions using function notation.		4.2
A.BC.7.b Interpret and evaluate composed functions for given values of the variable.		4.2
A.BC.7.c Find the inverse of a function using tables, graphs, and symbols.		4.3
A.BC.7.d Demonstrate that the composition of a function and its inverse returns the identity function, $f(f^{-1}(x)) = x$.		4.3
A.BC.7.e Investigate and determine the relationship between exponential and logarithmic functions.		8.2
A.BC.8 **Analyze the characteristics of power, polynomial, rational, exponential, radical, and periodic functions.**		
A.BC.8.a Identify and analyze theoretical and practical domain and range.		4.1, 4.4, 8.1, 8.2, 10.1
A.BC.8.b Determine the zeros, extrema, and intercepts.		4.1, 4.3, 4.4, 6.1, 8.1, 8.2, 9.1, Math Labs Ch. 9 (p. 420), 10.1
A.BC.8.c Identify intervals for which the function is continuous and/or discontinuous, increasing, and/or decreasing.		Math Labs Ch. 9 (p. 420)
A.BC.8.d Describe end behavior.		Math Labs Ch. 9 (p. 420)
A.BC.8.e Compare and contrast different types of functions.		4.4

A.BC.8.f Describe horizontal and vertical shifts as well as the stretching and shrinking of a function in comparison to the parent function.		4.5
A.BC.8.g Make connections among relationships represented in numeric, symbolic, graphical, and verbal forms.		4.1, 4.3, 4.4, 4.5, 6.1, 8.1, 8.2, 10.1
A.BC.9 **Represent situations involving repeated motion.**		
A.BC.9.a Model and graph problems involving repeated motion as a function of time (e.g. walking back and forth using a CBL).		Ch. 4 Math Labs (pp. 186-197) Ch. 10 Math Labs (p. 463)
A.BC.9.b Model by varying parameters of starting point, distance, rate, and repetitions.		Ch. 4 Math Labs (pp. 186-197) Ch. 10 Math Labs (p. 463)
A.BC.9.c Represent periodic functions (sine and cosine) using the unit circle and angles from special triangles.		13.1
A.BC.9.d Interpret periodic functions (sine and cosine), based on mathematical and real-world phenomena, by varying parameters (amplitude, vertical shift, and period).		12.3, 13.1
A.BC.10 **Apply transformations to functions.**		
A.BC.10.a Apply transformations to logarithmic functions, power functions, polynomial functions, rational functions, radical functions, and periodic functions.		4.5, 6.1, 7.3, 7.4, 7.5, 7.6, 8.1, 8.2, 9.1, 10.1, 13.1
A.BC.10.b Apply transformations to periodic functions (sine and cosine) and link graphically to amplitude, period, and vertical shift.		12.3, 13.1
G.BC.1 **Investigate and develop geometric relationships within an axiomatic system.**		
G.BC.1.a Complete simple logical truth tables for conjunction, disjunction, negation, and conditional relations.	Not Covered	

G.BC.1.b Identify hypotheses and conclusions, formulate logical statements, and investigate the validity of conditionals, converses, inverses, contrapositives, and biconditionals.	2.3	
G.BC.1.c Describe the structure and relationships between undefined terms, defined terms, axioms/postulates, methods of reasoning, and theorems.	1.1, 1.2, 1.3, 1.4, 1.5, 2.1, 2.2, 2.3, 2.4, 2.5, 2.6, 2.7, 2.8	
G.BC.1.d Perform geometric constructions to make connections among the geometric relationships discovered. • Paper-folding • Compass and straight-edge • Dynamic geometric software	1.4, Math Labs (all chapters use dynamic geometric software)	
G.BC.2 **Form conjectures and validate geometric relationships.**		
G.BC.2.a Form conjectures and verify by informal arguments or reject by counterexample.	2.1	
G.BC.2.b Informally develop direct and indirect arguments, identifying inconsistencies.	2.1, 2.2, 2.3, 2.4, 2.5, 2.6,	
G.BC.2.c Justify relationships about angles formed by perpendicular lines and transversals of parallel lines.	1.5, 2.7, 2.8	
G.BC.2.d Justify similarity and congruence relationships among triangles.	3.4, 3.5, 3.6, 3.7, 4.2, 4.3	
G.BC.3 **Apply similarity and congruence to solve problems, noting that congruence is a special case of similarity.**		
G.BC.3.a Identify and apply conditions that are sufficient to guarantee similarity of triangles (AA, SAS, SSS).	4.2, 4.3	
G.BC.3.b Identify and apply conditions that are sufficient to guarantee congruence of triangle, noting that congruence is a special case of similarity (SSS, SAS, ASA, AAS, HL).	3.4, 3.5, 3.6, 3.7	

G.BC.3.c Use properties of similarity and congruency to determine or calculate the measures of corresponding parts of similar figures.	4.3, 4.4, 4.5	
G.BC.3.d Apply properties of similarity and congruency to a variety of problem-solving contexts in mathematics and other disciplines.	4.3, 4.4, 4.5, Ch. 4 Math Applications	
G.BC.4 **Represent geometric transformations algebraically with matrices.**		
G.BC.4.a Describe figures on a coordinate plane using matrix notation, and use matrix operations to model translations, reflections, origin-centered dilations, and origin-centered rotations (90°, 180°, and 270°).	Ch. 11 Math Labs (pp. 711-713)	Ch. 3 Math Labs (p. 138)
G.BC.4.b Connect rigid transformations (translations, reflections, rotations) and origin-centered dilations with the relations of congruence and similarity.	11.1, 11.2, 11.3, 11.4, 11.5, 11.7	
G.BC.5 **Define and apply right triangle trigonometric ratios.**		
G.BC.5.a Determine side lengths and angle measures in right triangles using sine, cosine, and tangent.	5.4, 5.5	12.1
G.BC.6 **Represent and analyze circles in the coordinate plane.**		
G.BC.6.a Write the equation of a circle given: • the center and radius • the center and a point on the circle • the endpoints of the diameter	9.1	7.5

G.BC.7 **Build sound arguments to prove geometric relationships.**		
G.BC.7.a Prove or disprove conjectures or theorems related to: • angle bisectors • medians • isosceles triangles • perpendicular bisectors • altitudes • geometric mean	3.8, 4.1, 4.3, 4.5	
G.BC.7.b Prove the Pythagorean Theorem and its converse in multiple ways.	5.2	
G.BC.7.c Prove properties of special quadrilaterals.	6.3, 6.4, 6.5, 6.6	
G.BC.8 **Apply properties of polygons and circles.**		
G.BC.8.a Use properties of special quadrilaterals.	6.3, 6.4, 6.5, 6.6	
G.BC.8.b Identify and apply conditions that are sufficient to guarantee similarity of polygons with more than three sides.	4.2	
G.BC.8.c Identify and describe relationships among: • central angles • inscribed angles • circumscribed angles • right triangles in semicircles • radius of circles perpendicular to chords	9.3, 9.4, 9.5	
G.BC.9 **Use the Pythagorean Theorem, trigonometric ratios, properties, and similarity individually and in combination to solve problems.**		
G.BC.9.a Apply the Pythagorean Theorem to two- and three-dimensional settings.	5.2	
G.BC.9.b Develop and apply properties of special right triangles and triangle inequality.	3.3, 3.3, 5.3	

G.BC.10 **Analyze three-dimensional figures in terms of their volumes, surface areas, and cross-sectional shapes.**		
G.BC.10.a Apply formulas and solve problems involving volume and surface area of cones, spheres, and composite figures.	10.5, 10.6, 10.7	
G.BC.10.b Identify and apply the 3:2:1 relationship among volumes of circular cylinders, hemispheres, and cones with the same height and circular base and 3:1 relationship between the volume of a prism and pyramid with the same base area and height.	10.4, 10.5, 10.6, 10.7	
S.BC.1 **Use geometric models to solve probability problems.**		
S.BC.1.a Associate the sizes of partitioned regions within regular geometric figures with probabilities.	8.7	
S.BC.2 **Apply statistical ideas to develop linear models.**		
S.BC.2.a Interpret and compare linear models.		1.6
S.BC.2.b Determine linear models using median-fit lines and least-squares regression lines.		Not covered
S.BC.2.c Evaluate association of bivariate numerical data and use the correlation coefficient to measure linear association.		1.6
S.BC.2.d Evaluate the fit and appropriateness of a linear model by calculating the Sum of the Squared Errors or the Mean Absolute Deviation from the least-squares regression lines.		Not covered
S.BC.2.e Model trends in bivariate data displayed in scatter plots, using informal strategies to evaluate goodness of fit to models.		1.6