



**North Carolina Essential Standards
High School Math BC—Sample Integrated Mathematics II Course standards (must be paired
with an Integrated Math III course to complete the BC Essential Standards)**

Note on Numbering: **N**–Number and Operations, **A**–Algebra, **G**–Geometry, **M**–Measurement, **S**–Statistics and Probability and **D**–Discrete Mathematics

Note:

The mathematics writing committee recommends that a single set of standards spanning three mathematics levels be used for both the Algebra I/Geometry/Algebra II sequence and the Integrated I/II/III sequence. In the 2003 North Carolina Standard course of Study for Mathematics 9-12, there are two separate paths for high school mathematics that differ somewhat in content. In this new model, the content for both paths is the same, but the sequencing is different (i.e. the AlgI/Geo/Alg II sequence will continue to generally isolate geometric standards and algebraic standards). Schools will be able to choose their preferred sequencing, but the expectations for a student after completing both paths will be the same. The team believes this is a better way to ensure equity of opportunity as well as reduce the number of assessments that need to be developed and administered. It is important to note that this is a choice for school districts. Both sequences will lead to the same rigorous end.

Number and Operations

	Essential Standard	Clarifying Objectives	
MBC.N.1	Represent expressions involving rational exponents in various forms.	MBC.N.1.1	Translate numbers with rational exponents, limited to exponents in the form $1/n$, into expressions with n th roots.
		MBC.N.1.2	Represent algebraic expressions with exponents in their simplest forms.
MBC.N.2	Use arithmetic operations on matrices.	MBC.N.2.1	Represent numerical and relational data characterized with two or more variables using matrices.
		MBC.N.2.2	Use addition, subtraction and scalar multiplication of matrices.
		MBC.N.2.3	Use the properties of matrix multiplication and multiply matrices to solve problems in context.

Algebra

	Essential Standard	Clarifying Objectives	
MBC.A.1	Represent functions as mathematical models of real-world phenomena.	MBC.A.1.1	Represent absolute value, step and piecewise linear functions, and quadratic functions using models.
		MBC.A.1.2	Use graphs, symbols and tables to represent functions.
MBC.A.2	Use strategies to solve systems of equations and inequalities and interpret their solutions.	MBC.A.2.1	Use matrices to solve systems of linear equations, interpreting their solutions.
		MBC.A.2.2	Use appropriate strategies to solve systems of combinations of equations or inequalities, interpreting their solutions.
MBC.A.3	Represent transformations of families of functions.	MBC.A.3.1	Represent transformations of absolute value, quadratic and exponential functions in a coordinate plane.
		MBC.A.3.2	Illustrate translations, reflections and dilations.
MBC.A.4	To IM III	MBC.A.4.1	To IM III
		MBC.A.4.2	To IM III
MBC.A.5	To IM III	MBC.A.5.1	To IM III
		MBC.A.5.2	To IM III
		MBC.A.5.3	To IM III
		MBC.A.5.4	To IM III
MBC.A.6	To IM III	MBC.A.6.1	To IM III
		MBC.A.6.2	To IM III
MBC.A.7	Use appropriate properties and strategies to solve linear, quadratic, exponential, logarithmic and rational equations.	MBC.A.7.1	Use graphs, tables, factoring and the quadratic formula to solve quadratic equations with real number coefficients, interpreting the solutions.
		MBC.A.7.2	Represent rational equations with linear and quadratic denominators, in their simplest forms, identifying restrictions.
		MBC.A.7.3	To IM III
		MBC.A.7.4	To IM III
MBC.A.8	To IM III	MBC.A.8.1	To IM III
		MBC.A.8.2	To IM III
		MBC.A.8.3	To IM III
		MBC.A.8.4	To IM III
		MBC.A.8.5	To IM III
MBC.A.9	To IM III	MBC.A.9.1	To IM III
		MBC.A.9.2	To IM III
		MBC.A.9.3	To IM III
		MBC.A.9.4	To IM III
MBC.A.10	Analyze function transformations.	MBC.A.10.1	Compare different types of functions.
		MBC.A.10.2	Determine horizontal and vertical shifts as well as the stretching and shrinking of a function in comparison to the parent function

Geometry

	Essential Standard	Clarifying Objectives	
MBC.G.1	Infer geometric relationships within an axiomatic system.	MBC.G.1.1	Construct a simple logical truth table for conjunction, disjunction, negation and conditional relations.
		MBC.G.1.2	Infer conclusions from given information.
		MBC.G.1.3	Evaluate the validity of conclusions drawn from the validity of conditionals, converses, inverses, contrapositives and biconditionals.
		MBC.G.1.4	Summarize the structure and relationships between undefined terms, defined terms, axioms/postulates, methods of reasoning and theorems.
		MBC.G.1.5	Use paper-folding techniques, compasses and straight edges and dynamic geometric software to make connections among geometric relationships.
MBC.G.2	Generate conjectures in order to test and validate geometric relationships.	MBC.G.2.1	Generate conjectures which can be verified by informal arguments or reject by counterexample
		MBC.G.2.2	Generate direct and indirect arguments and identify inconsistencies.
		MBC.G.2.3	Explain the relationships among angles formed by perpendicular lines and transversals of parallel lines.
		MBC.G.2.4	To IM III
MBC.G.3	To IM III	MBC.G.3.1	To IM III
		MBC.G.3.2	To IM III
		MBC.G.3.3	To IM III
MBC.G.4	Represent geometric transformations algebraically using matrices.	MBC.G.4.1	Use matrix operations to model translations, reflections, origin-centered dilations and origin-centered rotations (90, 180, and 270).
		MBC.G.4.2	Understand the relationship of rigidity to congruence and that of dilations to similarity.
MBC.G.5	To IM III	MBC.G.5.1	To IM III
MBC.G.6	Construct arguments to prove geometric conjectures and theorems.	MBC.G.6.1	To IM III
		MBC.G.6.2	Construct arguments to prove the Pythagorean Theorem and its converse in multiple ways.
		MBC.G.6.3	Construct arguments to prove properties of special quadrilaterals.
MBC.G.7	To IM III	MBC.G.7.1	To IM III
		MBC.G.7.2	To IM III
MBC.G.8	To IM III	MBC.G.8.1	To IM III
		MBC.G.8.2	To IM III
		MBC.G.8.3	To IM III
MBC.G.9	Analyze three-dimensional figures in terms of their volumes, surface areas and cross-sectional shapes.	MBC.G.9.1	Use formulas and strategies to solve problems involving volume and surface area of cones, spheres and composite figures.
		MBC.G.9.2	Use 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.

Statistics and Probability

	Essential Standard	Clarifying Objectives	
MBC.S.1	Use geometric models to solve probability problems.	MBC.S.1.1	Use the sizes of partitioned regions within regular geometric figures to solve probability problems.
MBC.S.2	Apply statistical concepts and principles to develop linear models.	MBC.S.2.1	Generate linear models using least-squares regression lines.
		MBC.S.2.2	Evaluate the strength of relationship for bivariate numerical data both informally and by using the correlation coefficient.
		MBC.S.2.3	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.
		MBC.S.2.4	Infer trends in bivariate data displayed in scatter plots, and best fit lines.
MBC.S.3	To IM III	MBC.S.3.1	To IM III
		MBC.S.3.2	To IM III
		MBC.S.3.3	To IM III

Discrete

	Essential Standard	Clarifying Objectives	
MBC.D.1	Use weighted vertex-edge graphs, critical path analysis and weighted digraphs to solve problems dealing with optimization.	MBC.D.1.1	Use weighted vertex-edge graphs and minimum spanning trees to solve problems.
		MBC.D.1.2	Use critical path analysis and weighted digraphs to optimally schedule large projects that are comprised of many smaller tasks.
MBC.D.2	To IM III	MBC.D.2.1	To IM III