NSCAS Alternate Math Table of Specifications - Grade 11

MA 11.1	NUMBER: Students will communicate number sense concepts using multiple representations to reason, solve problems, and make connections within mathematics and across disciplines.					
MA 11.1.1	Numeric Relationships: Students will demonstrate, represent, and show relationships among the subsets of real numbers and the complex number system.	Max DOK Level	DOK 1 Stage 1 Stage 2	DOK 1 Stage 3	DOK 2 Stage 4	Item Total
MA 11.1.1.a	Compare and contrast subsets of the complex number system, including imaginary, rational, irrational, integers, whole, and natural numbers. *Extended: Sort fractions, decimals, and whole numbers by type (e.g., 3/5, 4, 1.7).*		0 — 2	0 — 1	0 — 1	0 — 4
MA 11.1.2	Operations: Students will compute with real and complex numbers.	Max DOK Level	DOK 1 Stage 1 Stage 2	DOK 1 Stage 3	DOK 2 Stage 4	Item Total
MA 11.1.2.a	Compute with subsets of the complex number system, including imaginary, rational, irrational, integers, whole, and natural numbers. *Extended: Add and subtract two-digit numbers with regrouping.*		0 — 2	0 — 1	0 — 1	0 — 4
MA 11.1.2.b	Simplify expressions with rational exponents. *Extended: Rewrite a repeated multiplication problem as an exponential expression with a whole number base and a whole number exponent (e.g., 3 x 3 x 3 x 3 = 3^4).*		0 — 2	0 — 1	0 — 1	0 — 4
MA 11.1.2.c	Select, apply, and explain the method of computation when problem solving using real numbers (e.g., models, mental computation, paper-pencil, or technology). *Extended: Given a real-world problem, identify an operation that leads to a solution.*		0 — 2	0 — 1	0 — 1	0 — 4

MA 11.2	ALGEBRA: Students will communicate algebraic concepts using multiple representations to reason, solve problems, and make connections within mathematics and across disciplines. MA 11.2.1 Algebraic Relationships					
MA 11.2.1	Algebraic Relationships: Students will demonstrate, represent, and show relationships with functions.	Max DOK Level	DOK 1 Stage 1 Stage 2	DOK 1 Stage 3	DOK 2 Stage 4	Item Total
MA 11.2.1.b	Analyze a relation to determine if it is a function given graphs, tables, or algebraic notation. *Extended: Identify a graph that represents a given linear function from a table.*		0 — 2	0 — 1	0 — 1	0 — 4
MA 11.2.1.c	Classify a function given graphs, tables, or algebraic notation, as linear, quadratic, or neither. *Extended: Identify a linear function from a graph.*		0 — 2	0 — 1	0 — 1	0 — 4
MA 11.2.1.e	Analyze and graph linear functions and inequalities (point-slope form, slope-intercept form, standard form, intercepts, rate of change, parallel and perpendicular lines, vertical and horizontal lines, and inequalities). *Extended: Given an x-, y- table of values, determine if the graph of the values forms a horizontal line or a vertical line.*		0 — 2	0 — 1	0 — 1	0 — 4
MA 11.2.1.g	Analyze and graph quadratic functions (standard form, vertex form, finding zeros, symmetry, transformations, determine intercepts, and minimums or maximums). *Extended: Use the graph of a linear function to locate the ordered pair where y = 0.*		0 — 2	0 — 1	0 — 1	0 — 4
MA 11.2.2	Algebraic Processes: Students will apply the operational properties when evaluating rational expressions, and solving linear and quadratic equations, and inequalities.	Max DOK Level	DOK 1 Stage 1 Stage 2	DOK 1 Stage 3	DOK 2 Stage 4	Item Total
MA 11.2.2.a	Convert equivalent rates (e.g., miles per hour to feet per second). *Extended: Convert equivalent rate using money.*		0 — 2	0 — 1	0 — 1	0 — 4
MA 11.2.2.d	Perform operations on rational expressions (add, subtract, multiply, divide, and simplify). *Extended: Add two linear expressions (e.g., (2x +*		0 — 2	0 — 1	0 — 1	0 — 4
MA 11.2.2.e	Evaluate expressions at specified values of their variables (polynomial, rational, radical, and absolute value).		0 — 2	0 — 1	0 — 1	0 — 4

			DOK 1 Stage 1 Stage 2	DOK 1 Stage 3	DOK 2 Stage 4	Item Total
MA 11.2.2.g	Solve linear and absolute value equations and inequalities. *Extended: Identify the absolute value of a negative integer.*		0 — 2	0 — 1	0 — 1	0 — 4
MA 11.2.2.h	Analyze and solve systems of two linear equations and inequalities in two variables algebraically and graphically. *Extended: Identify the ordered pair of the graphical solution to a system of two linear equations.*		0 — 2	0 — 1	0 — 1	0 — 4
MA 11.2.3	**Applications: Students will solve real-world problems involving linear equations and inequalities, systems of linear equations, quadratic, exponential, square root, and absolute value functions.**	**Max DOK Level**	**DOK 1 Stage 1 Stage 2**	**DOK 1 Stage 3**	**DOK 2 Stage 4**	**Item Total**

MA 11.3	GEOMETRY: Students will communicate geometric concepts and measurement concepts using multiple representations to reason, solve problems, and make connections within mathematics and across disciplines.					
MA 11.3.1	**Characteristics: Students will identify and describe geometric characteristics and create two- and three-dimensional shapes.**	**Max DOK Level**	**DOK 1 Stage 1 Stage 2**	**DOK 1 Stage 3**	**DOK 2 Stage 4**	**Item Total**
MA 11.3.1.c	Apply geometric properties to solve problems involving similar triangles, congruent triangles, quadrilaterals, and other polygons. *Extended: Identify corresponding angles of congruent triangles.*		0 — 2	0 — 1	0 — 1	0 — 4
MA 11.3.1.d	Identify and apply right triangle relationships including sine, cosine, tangent, special right triangles, and the converse of the Pythagorean Theorem. *Extended: Distinguish between right triangles and non-right triangles.*		0 — 2	0 — 1	0 — 1	0 — 4
MA 11.3.2	**Coordinate Geometry: Students will determine location, orientation, and relationships on the coordinate plane.**	**Max DOK Level**	**DOK 1 Stage 1 Stage 2**	**DOK 1 Stage 3**	**DOK 2 Stage 4**	**Item Total**
MA 11.3.2.b	Use coordinate geometry to analyze linear relationships to determine if lines are parallel or perpendicular. *Extended: Distinguish between perpendicular, intersecting, and parallel lines.*		0 — 2	0 — 1	0 — 1	0 — 4
MA 11.3.2.c	Given a line, write the equation of a line that is parallel or perpendicular to it. *Extended: Identify graphs of linear equations that have parallel lines or same slopes.*		0 — 2	0 — 1	0 — 1	0 — 4
MA 11.3.2.d	Derive and apply the distance formula. *Extended: Identify the hypotenuse of right triangles.*		0 — 2	0 — 1	0 — 1	0 — 4
MA 11.3.2.e	Use coordinate geometry to prove triangles are right, acute, obtuse, isosceles, equilateral, or scalene. *Extended: Identify isosceles, equilateral, or scalene triangles.*		0 — 2	0 — 1	0 — 1	0 — 4
MA 11.3.2.f	Use coordinate geometry to prove quadrilaterals are trapezoids, isosceles trapezoids, parallelograms, rectangles, rhombi, kites, or squares. *Extended: Identify the quadrilateral on the coordinate grid as a trapezoid, a rectangle, or a kite.*		0 — 2	0 — 1	0 — 1	0 — 4

MA 11.3.3	Measurement: Students will perform and compare measurements and apply formulas.	Max DOK Level	DOK 1 Stage 1 Stage 2		DOK 1 Stage 3		DOK 2 Stage 4		Item Total	
MA 11.3.3.d	Find arc length and area of sectors of a circle. *Extended: Find the arc length of a circle as one-fourth, one-half, or three-fourths of the circle.*		0	— 2	0	— 1	0	— 1	0	— 4
MA 11.3.3.e	Determine surface area and volume of spheres, cones, pyramids, and prisms using formulas and appropriate units. *Extended: Find the surface area of one face of a rectangular prism.*		0	— 2	0	— 1	0	— 1	0	— 4

MA 11.4	DATA: Students will communicate data analysis/probability concepts using multiple representations to reason, solve problems, and make connections within mathematics and across disciplines.					
MA 11.4.1	Representations: Students will create displays that represent data.					
MA 11.4.2	Analysis & Applications: Students will analyze data to address the situation.	Max DOK Level	DOK 1 Stage 1 Stage 2	DOK 1 Stage 3	DOK 2 Stage 4	Item Total
MA 11.4.2.a	Identify and compute measures of central tendency (mean, median, mode) when provided data both with and without technology. *Extended: Find the mean or median of an odd-numbered set of ordered data.*		0 — 2	0 — 1	0 — 1	0 — 4
MA 11.4.3	Probability: Students will interpret and apply concepts of probability.	Max DOK Level	DOK 1 Stage 1 Stage 2	DOK 1 Stage 3	DOK 2 Stage 4	Item Total
MA 11.4.3.b	Use appropriate counting techniques to determine the probability of an event. *Extended: Use the appropriate counting principle to determine the combinations for an event.*		0 — 2	0 — 1	0 — 1	0 — 4
MA 11.4.3.c	Determine if events are mutually exclusive and calculate their probabilities in either case. *Extended: Identify a pair of mutually exclusive outcomes.*		0 — 2	0 — 1	0 — 1	0 — 4