

Nebraska State Mathematics Test Table of Specifications

Grade 11

NUMBER SENSE

Gr11 Number System	DOK Level	DOK 1	DOK 2	DOK 3	Item Total
MA 12.1.1 Students will represent and show relationships among real numbers.					
<i>MA 12.1.1.a Demonstrate multiple equivalent forms of irrational numbers</i>	Assessed at the local level				
<i>MA 12.1.1.b Compare, contrast, and apply the properties of numbers and the real number system, including the rational, irrational, imaginary and complex numbers</i>	Assessed at the local level				
Gr11 Operations	DOK Level	DOK 1	DOK 2	DOK 3	Item Total
MA 12.1.2 Students will demonstrate the meaning and effects of arithmetic operations with real numbers.					
<i>MA 12.1.2.a Use drawings, words, and symbols to explain the effects of such operations as multiplication and division, and computing positive powers and roots on the magnitude of quantities</i>	Assessed at the local level				
<i>MA 12.1.2.b Use drawings, words, and symbols to explain that the distance between two numbers on the number line is the absolute value of their difference</i>	Assessed at the local level				
Gr11 Computation	DOK Level	DOK 1	DOK 2	DOK 3	Item Total
MA 12.1.3 Students will compute fluently and accurately using appropriate strategies and tools.					
<i>MA 12.1.3.a Compute accurately with real numbers</i>	1	1-2	0	0	1-2
<i>MA 12.1.3.b Simplify exponential expressions</i>	2	0	1-2	0	1-2
<i>MA 12.1.3.c Multiply and divide numbers using scientific notation</i>	Assessed at the local level				
<i>MA 12.1.3.d Select, apply, and explain the method of computation when problem solving using real numbers</i>	Assessed at the local level				
Gr11 Estimation	DOK Level	DOK 1	DOK 2	DOK 3	Item Total
MA 12.1.4 Students will estimate and check reasonableness of answers using appropriate strategies and tools.					

MA 12.1.4.a Use estimation methods to check the reasonableness of real number computations and decide if the problem calls for an approximation or an exact number	2	0-1	1-2	0	1-3
MA 12.1.4.b Distinguish relevant from irrelevant information, identify missing information and either find what is needed or make appropriate estimates	Assessed at the local level				
GEOMETRIC/MEASUREMENT CONCEPTS					
Gr11 Characteristics	DOK Level	DOK 1	DOK 2	DOK 3	Item Total
MA 12.2.1 Students will analyze characteristics, properties, and relationships among geometric shapes and objects.					
12.2.1.a Identify and explain the necessity of and give examples of definitions and theorems	Assessed at the local level				
MA 12.2.1.b Analyze properties and relationships among classes of two and three dimensional geometric objects using inductive reasoning and counterexamples	Assessed at the local level				
MA 12.2.1.c State and prove geometric theorems using deductive reasoning	Assessed at the local level				
MA 12.2.1.d Apply geometric properties to solve problems	2	0-1	3-4	0	3-5
MA 12.2.1.e Identify and apply right triangle relationships	2	0-1	2-4	0	2-5
MA 12.2.1.f Recognize that there are geometries, other than Euclidean geometry, in which the parallel postulate is not true	Assessed at the local level				
MA 12.2.1.g Know the definitions and basic properties of a circle and use them to prove basic theorems and solve problems	Assessed at the local level				
Gr11 Coordinate Geometry	DOK Level	DOK 1	DOK 2	DOK 3	Item Total
MA 12.2.2 Students will use coordinate geometry to analyze and describe relationships in the coordinate plane.					
MA 12.2.2.a Use coordinate geometry to analyze geometric situations	2	0-1	2-3	0	2-4
MA 12.2.2.b Apply the midpoint formula	Assessed at the local level				
MA 12.2.2.c Apply the distance formula	2	0-1	1-2	0	1-3
MA 12.2.2.d Prove special types of triangles and quadrilaterals	3	0	0-1	1-2	1-3
Gr11 Transformations	DOK Level	DOK 1	DOK 2	DOK 3	Item Total
MA 12.2.3 Students will apply and analyze transformations.					

MA 12.2.3.a Explain and justify the effects of simple transformations on the ordered pairs of two-dimensional shapes	Assessed at the local level				
MA 12.2.3.b Perform and describe multiple transformations	Assessed at the local level				
Gr11 Spatial Modeling	DOK Level	DOK 1	DOK 2	DOK 3	Item Total
MA 12.2.4 Students will use visualization, spatial reasoning, and geometric modeling to solve problems.					
MA 12.2.4.a Sketch and draw appropriate representations of geometric objects using ruler, protractor, or technology	Assessed at the local level				
MA 12.2.4.b Use geometric models to visualize, describe, and solve problems	2	0-1	2-3	0	2-4
Gr11 Measurement	DOK Level	DOK 1	DOK 2	DOK 3	Item Total
MA 12.2.5 Students will apply the units, systems, and formulas to solve problems.					
MA 12.2.5.a Use strategies to find surface area and volume of complex objects	Assessed at the local level				
MA 12.2.5.b Apply appropriate units and scales to solve problems involving measurement	Assessed at the local level				
MA 12.5.c Convert between various units of area and volume, such as square feet to square yards	Assessed at the local level				
MA 12.2.5.d Convert equivalent rates	2	1-2	1-2	0	2-4
MA 12.2.5.e Find arc length and area of sectors of a circle	Assessed at the local level				
MA 12.2.5.f Determine surface area and volume of three-dimensional objects	Assessed at the local level				
MA 12.2.5.g Know that the effect of a scale factor k on length, area and volume is to multiply each k , k^2 and k^3 , respectively	Assessed at the local level				
ALGEBRAIC CONCEPTS					
Gr11 Relationships	DOK Level	DOK 1	DOK 2	DOK 3	Item Total
MA 12.3.1 Students will generalize, represent, and analyze relationships using algebraic symbols.					
MA 12.3.1.a Represent, interpret, and analyze functions with graphs, tables, and algebraic notation, and convert among these representations	3	0	2-3	1-2	3-5
MA 12.3.1.b Identify domain and range of functions represented in either symbolic or graphical form	Assessed at the local level				

MA 12.3.1.c Identify the slope and intercepts of a linear relationship from an equation or graph	2	0-1	2-3	0	2-4
MA 12.3.1.d Identify characteristics of linear and non-linear functions	3	0	2-3	1-2	3-5
MA 12.3.1.e Graph linear and non-linear functions	Assessed at the local level				
MA 12.3.1.f Compare and analyze the rate of change by using ordered pairs, tables, graphs, and equations	3	0	1-2	1-2	2-4
MA 12.3.1.g Graph and interpret linear inequalities	Assessed at the local level				
MA 12.3.1.h Represent, interpret, and analyze functions and their inverses	Assessed at the local level				
MA 12.3.1.i Determine if a relation is a function	Assessed at the local level				
Gr11 Modeling in Context	DOK Level	DOK 1	DOK 2	DOK 3	Item Total
MA 12.3.2 Students will model and analyze quantitative relationships.					
MA 12.3.2.a Model contextualized problems using various representations	Assessed at the local level				
MA 12.3.2.b Represent a variety of quantitative relationships using linear equations and one variable inequalities	3	0	0	2-4	2-4
MA 12.3.2.c Analyze situations to determine the type of algebraic relationship	Assessed at the local level				
MA 12.3.2.d Model contextualized problems using various representations for non-linear functions	Assessed at the local level				
Gr11 Procedures	DOK Level	DOK 1	DOK 2	DOK 3	Item Total
MA 12.3.3 Students will represent and solve equations and inequalities.					
MA 12.3.3.a Explain/apply the reflexive, symmetric, and transitive properties of equality	Assessed at the local level				
MA 12.3.3.b Simplify algebraic expressions involving exponents	1	1-3	0	0	1-3
MA 12.3.3.c Add and subtract polynomials	1	1-3	0	0	1-3
MA 12.3.3.d Multiply and divide polynomials	1	1-3	0	0	1-3
MA 12.3.3.e Factor polynomials	Assessed at the local level				
MA 12.3.3.f Identify and generate equivalent forms of linear equations	1	1-3	0	0	1-3
MA 12.3.3.g Solve linear equations and inequalities including absolute value	Assessed at the local level				
MA 12.3.3.h Identify and explain the properties used in solving equations and inequalities	Assessed at the local level				

MA 12.3.3.i Solve quadratic equations	Assessed at the local level
MA 12.3.3.j Add, subtract, and simplify rational expressions	Assessed at the local level
MA 12.3.3.k Multiply, divide, and simplify rational expressions	Assessed at the local level
MA 12.3.3.l Evaluate polynomial and rational expressions and expressions containing radicals and absolute values at specified values of their variables	Assessed at the local level
MA 12.3.3.m Derive and use the formulas for the general term and summation of finite arithmetic and geometric series	Assessed at the local level
MA 12.3.3.n Combine functions by composition, as well as by addition, subtraction, multiplication, and division	Assessed at the local level
MA 12.3.3.o Solve an equation involving several variables for one variable in terms of the others	Assessed at the local level
MA 12.3.3.p Analyze and solve systems of two linear equations in two variables algebraically and graphically	Assessed at the local level

DATA ANALYSIS/PROBABILITY CONCEPTS

Gr11 Display and Analysis	DOK Level	DOK 1	DOK 2	DOK 3	Item Total
MA 12.4.1 Students will formulate a question and design a survey or an experiment in which data is collected and displayed in a variety of formats, then select and use appropriate statistical methods to analyze the data.					
MA 12.4.1.a Interpret data represented by the normal distribution and formulate conclusions	Assessed at the local level				
MA 12.4.1.b Compute, identify, and interpret measures of central tendency (mean, median, mode) when provided a graph or data set	Assessed at the local level				
MA 12.4.1.c Explain how sample size and transformations of data affect measures of central tendency	Assessed at the local level				
MA 12.4.1.d Describe the shape and determine the spread (variance, standard deviation) and outliers of a data set	2	0	2-3	0	2-3
MA 12.4.1.e Explain how statistics are used or misused in the world	Assessed at the local level				
MA 12.4.1.f Create scatter plots, analyze patterns, and describe relationships in paired data	Assessed at the local level				
MA 12.4.1.g Explain the impact of sampling methods, bias, and the phrasing of questions asked during data collection and the conclusions that can rightfully be made	Assessed at the local level				

<i>MA 12.4.1.h Explain the differences between randomized experiment and observational studies</i>	Assessed at the local level				
Gr11 Predictions and Inferences	DOK Level	DOK 1	DOK 2	DOK 3	Item Total
MA 12.4.2 Students will develop and evaluate inferences to make predictions.					
<i>MA 12.4.2.a Compare data sets and evaluate conclusions using graphs and summary statistics</i>	Assessed at the local level				
<i>MA 12.4.2.b Support inferences with valid arguments</i>	Assessed at the local level				
<i>MA 12.4.2.c Develop linear equations for linear models to predict unobserved outcomes using regression line and correlation coefficient</i>	Assessed at the local level				
<i>MA 12.4.2.d Recognize when arguments based on data confuse correlation with causation</i>	Assessed at the local level				
Gr11 Probability	DOK Level	DOK 1	DOK 2	DOK 3	Item Total
MA 12.4.3 Students will apply and analyze concepts of probability.					
<i>MA 12.4.3.a Construct a sample space and a probability distribution</i>	Assessed at the local level				
<i>MA 12.4.3.b Identify dependent and independent events and calculate their probabilities</i>	2	1-2	1-2	0	2-4
<i>MA 12.4.3.c Use the appropriate counting techniques to determine the probability of an event</i>	2	1-2	0-1	0	1-3
<i>MA 12.4.3.d Analyze events to determine if they are mutually exclusive</i>	2	0-1	1-2	0	1-3
<i>MA 12.4.3.e Determine the relative frequency of a specified outcome of an event to estimate the probability of the outcome</i>	Assessed at the local level				