North Dakota Mathematics Standards

Grade 8

Adopted 2023

Eighth Grade

Math Attributes

Problem-Solving

P. Learners can analyze information and formulate a flexible, systematic plan to problem-solve authentic situations and reflect on the reasonableness of the solution, making revisions when necessary. 8.MA.P

Connections

C. Learners can create connections within and across concepts and provide examples of how they relate to other learning and ideas using supporting evidence. 8.MA.C

Reasoning and Proof

R. Learners can reason logically, citing evidence to evaluate and explain what they see, think, and conclude through exploration and justification. 8.MA.R

Number and Operations

Number Systems

1. Compare and classify real numbers within the real number system. 8.NO.NS.1
2. Use rational approximations of irrational numbers to compare the size of irrational numbers, locate them on a number line diagram, and estimate the value of irrational expressions involving one operation. 8.NO.NS.2
3. Use scientific notation to represent very large or very small quantities. Interpret scientific notation generated by technology. Compare and order numbers in both scientific and standard notation. 8.NO.NS.3

Operations

1. Evaluate mentally the square roots of perfect squares up to 225 and cube roots of perfect cubes up to 1000. 8.NO.O.1
2. Add, subtract, multiply, and divide rational numbers using strategies or procedures. 8.NO.O.2

Algebraic Reasoning

Expressions and Equations

1. Explain the relationship between repeated multiplication and the properties of integer exponents. Apply a single exponent property to generate equivalent numeric and algebraic expressions that include numerical coefficients. 8.AR.EE.1
2. Use square root and cube root symbols to represent solutions to equations of the form $x^2 = p$ and $x^3 = p$, where p is a non-negative rational number. 8.AR.EE.2
3. Explain the characteristics of a linear relationship, including identifying the slope and y-intercept in tables, graphs, equations, and descriptions. 8.AR.EE.3
4. Represent linear relationships using tables, graphs, equations, and descriptions when given a relationship in one of these forms. 8.AR.EE.4
5. Solve linear equations with rational number coefficients and variables on both sides, including equations that require using the distributive property and/or combining and collecting like terms. Interpret the number of solutions. Give examples of linear equations in one variable with one solution, infinitely many solutions, or no solutions. 8.AR.EE.5
6. Read, write, and evaluate numerical and algebraic expressions including expressions involving absolute value. Solve and graph equations of the form $|x|=r$ where r is a nonnegative rational number. 8.AR.EE.6
7. Solve and graph inequalities in one variable with rational number coefficients and variables on both sides, including inequalities that require using the distributive property and/or combining like terms. 8.AR.EE.7
8. Graph linear inequalities in two variables on a coordinate plane. Interpret the possible solutions in the context of authentic problems. 8.AR.EE.8

Functions

1. Defend whether a relation is a function from various representations using appropriate function language. 8.AR.F.1
2. Compare and contrast properties of two linear functions, each represented in a different way (algebraically, graphically, numerically in tables, and/or by descriptions). 8.AR.F.2
3. Compare and contrast linear and non-linear functions represented in different ways (algebraically, graphically, numerically in tables, and/or by descriptions). 8.AR.F.3
4. Model a linear function between two quantities by creating a table, graph, and equation. Interpret the rate of change and initial value of a linear function in terms of the situation it models. 8.AR.F.4
5. Describe qualitatively the functional relationship between two quantities by analyzing a graph including where the function is constant, increasing, or decreasing; linear or nonlinear; and discrete or continuous. Create a graph that exhibits the qualitative features of a function described. 8.AR.F.5

Geometry and Measurement

Area and Volume

1. Apply given formulas to solve problems involving the volume of cones, cylinders, and spheres, including authentic problems. 8.GM.AV.1

Geometric Figures

1. Perform single transformations to a figure on the coordinate plane and determine whether the figures are congruent or similar. 8.GM.GF.1
2. Describe the characteristics of transformations on the coordinate plane using transformation language. 8.GM.GF.2
3. Name the type of transformation needed to map a pre-image to its image. 8.GM.GF.3
4. Describe the following angle-pair relationships: interior and exterior angles of triangles and angles formed when a transversal cuts parallel lines or intersecting lines. Solve for an unknown angle in a figure by applying facts about these angles. 8.GM.GF.4
5. Describe the relationship between the leg lengths and the hypotenuse length of a right triangle. Determine whether a triangle is a right triangle using this relationship. 8.GM.GF.5
6. Apply the Pythagorean Theorem to determine unknown side lengths in right triangles in two and three dimensions on and off a coordinate plane, including authentic problems. 8.GM.GF.6

Data, Probability, and Statistics

Data Analysis

1. Interpret scatter plots for bivariate measurement data to investigate patterns such as clustering, outliers, positive or negative association, linear association, and nonlinear association. 8.DPS.D.1
2. Draw an informal trend line on a given scatter plot with a linear association and justify its fit by describing the closeness of the data points to the line. 8.DPS.D.2
3. Solve authentic problems in the context of bivariate measurement data by interpreting the slope and intercept(s) and making predictions using a linear model. 8.DPS.D.3
4. Construct and interpret a two-way table summarizing bivariate categorical data collected from the same subjects. 8.DPS.D.4