

North Dakota Mathematics Content Standards

High School: Algebra II Prioritized Standards

Northeast Education Services Cooperative (NESC) - 2017



How to Read This Document

Example: HS.A-SSE.1

"HS.A-SSE.1" references the grade level followed by the course, domain and then the standard. This coding is taken directly from the North Dakota Department of Public Instruction's standards document.

Prioritized Standards

Seeing Structure in Expressions

Interpret the structure of expressions:

Code	Standard	Endurance	Leverage	Readiness	Assessment	Teacher Judgement	Total Score
HS.A-SSE.2	Use the structure of an expression to identify ways to rewrite it.	✓		✓	✓	✓	4

Write expressions in equivalent forms to solve problems:

Code	Standard	Endurance	Leverage	Readiness	Assessment	Teacher Judgement	Total Score
HS.A-SSE.3	Choose and produce an equivalent form of an expression to reveal and explain properties of the quantity represented by the expression. a. Factor a quadratic expression to reveal the zeros of the function it defines. b. Complete the square in a quadratic expression to produce an equivalent expression. c. Use the properties of exponents to transform exponential expressions.	✓		✓	✓	✓	4

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Arithmetic with Polynomials and Rational Expressions

Perform arithmetic operations on polynomials:
No standards were prioritized within this cluster.

Understand the relationship between zeros and factors of polynomials:

Code	Standard	Endurance	Leverage	Readiness	Assessment	Teacher Judgement	Total Score
HS.A-APR.3	Identify zeros of polynomials when suitable factorizations are available. Use the zeros to construct a rough graph of the function defined by the polynomial.	✓		✓	✓	✓	4

Use polynomial identities to solve problems:
No standards were prioritized within this cluster.

Rewrite rational expressions:

Code	Standard	Endurance	Leverage	Readiness	Assessment	Teacher Judgement	Total Score
HS.A-APR.7	Add, subtract, multiply, and divide rational expressions. Understand that rational expressions form a system comparable to the rational numbers, closed under addition, subtraction, multiplication, and division by a nonzero rational expression.	✓		✓	✓	✓	4

Creating Equations and Inequalities

Create equations that describe numbers or relationships:
No standards were prioritized within this cluster.

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Reasoning with Equations and Inequalities

Understand solving equations as a process of reasoning and explain the reasoning:

Code	Standard	Endurance	Leverage	Readiness	Assessment	Teacher Judgement	Total Score
HS.A-REI.2	Solve simple rational and radical equations in one variable, and give examples showing how extraneous solutions may arise.	✓		✓	✓	✓	4

Solve equations and inequalities in one variable:

Code	Standard	Endurance	Leverage	Readiness	Assessment	Teacher Judgement	Total Score
HS.A-REI.4	Solve quadratic equations in one variable. a. Use the method of completing the square to transform any quadratic equation in x into an equation of the form $(x - p)^2 = q$ that has the same solutions. (+) Derive the quadratic formula from this form. b. Solve quadratic equations by inspection (e.g., for $x^2 = 49$), taking square roots, completing the square, the quadratic formula and factoring, as appropriate to the initial form of the equation. Recognize when the quadratic formula gives complex solutions and write them as $a \pm bi$ for real numbers a and b .	✓		✓	✓	✓	4

Solve systems of equations:

Code	Standard	Endurance	Leverage	Readiness	Assessment	Teacher Judgement	Total Score
HS.A-REI.7	Solve a simple system consisting of a linear equation and a quadratic equation in two variables algebraically and graphically.	✓	✓	✓	✓	✓	5

Represent and solve equations and inequalities graphically:

No standards were prioritized within this cluster.

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Interpreting Functions

Understand the concept of a function and use function notation:

No standards were prioritized within this cluster.

Seeing Structure in Expressions

Interpret functions that arise in applications in terms of the context

Code	Standard	Endurance	Leverage	Readiness	Assessment	Teacher Judgement	Total Score
HS.F-IF.4	Use tables, graphs, verbal descriptions, and equations to interpret and sketch the key features of a function modeling the relationship between two quantities.	✓	✓	✓	✓	✓	5
HS.F-IF.5	Relate the domain of a function to its graph and, where applicable, to the quantitative relationship it describes.	✓	✓	✓	✓	✓	5
HS.F-IF.6	Calculate and interpret the average rate of change of a function (presented symbolically or as a table) over a specified interval. Estimate the rate of change from a graph.	✓	✓	✓	✓	✓	5

Analyze functions using different representations

Code	Standard	Endurance	Leverage	Readiness	Assessment	Teacher Judgement	Total Score
HS.F-IF.7 b,c,e,f	Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases. b. Graph square root, cube root, and piecewise-defined functions, including step functions and absolute value functions. c. Graph polynomial functions, identifying zeros when suitable factorizations are available, and showing end behavior. e. Graph exponential and logarithmic functions, showing intercepts and end behavior. Example: Solve the annual compound interest formula $A = P(1 + r)t$ for t and draw	✓	✓	✓	✓	✓	5

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	a graph of time vs. amount for a given rate and principle amount, showing intercepts and end behavior. Compare this graph to the graph of amount vs. time. f. Graph $f(x) = \sin x$ and $f(x) = \cos x$ as representations of periodic phenomena.						
HS.F-IF.8	Write a function defined by an expression in different but equivalent forms to reveal and explain different properties of the function. a. Use the process of factoring and completing the square in a quadratic function to show zeros, extreme values, and symmetry of the graph, and interpret these in terms of a context. b. Use the properties of exponents to interpret expressions for exponential functions.	✓		✓	✓	✓	4
HS.F-IF.9	Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions).	✓	✓	✓	✓	✓	5

Building Functions

Build new functions from existing functions:

Code	Standard	Endurance	Leverage	Readiness	Assessment	Teacher Judgement	Total Score
HS.F-BF.5	Understand the inverse relationship between exponents and logarithms and use this relationship to solve problems involving logarithms and exponents.	✓		✓	✓	✓	4

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Linear, Quadratic, and Exponential Models

Construct and compare linear, quadratic, and exponential models and solve problems:

Code	Standard	Endurance	Leverage	Readiness	Assessment	Teacher Judgement	Total Score
HS.F-LE.4	Use logarithms to express the solution to $ab^{ct} = d$ where a , c , and d are real numbers and b is a positive real number. Evaluate the logarithm using technology when appropriate.	✓		✓	✓	✓	4

Expressing Geometric Properties with Equations

Understand and use conic sections:

Code	Standard	Endurance	Leverage	Readiness	Assessment	Teacher Judgement	Total Score
HS.G-GPE.3	Identify key features of conic sections given their equations. Apply properties of conic sections in real world situations.*	✓		✓	✓	✓	4

Interpreting Categorical and Quantitative Data

Summarize, represent, and interpret data on two categorical and quantitative variables:

Code	Standard	Endurance	Leverage	Readiness	Assessment	Teacher Judgement	Total Score
HS.S-ID.6 a,b	Represent data on two quantitative variables on a scatter plot, and describe how the variables are related. a. Fit a function to the data (with or without technology). Use functions fitted to data to solve problems in the context of the data. b. (+) Informally assess the fit of a function by plotting and analyzing residuals.	✓	✓	✓	✓	✓	5

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The Real Number System

Extend the properties of exponents to rational numbers:

Code	Standard	Endurance	Leverage	Readiness	Assessment	Teacher Judgement	Total Score
HS.N-RN.2	Rewrite expressions involving radicals and rational exponents using the properties of exponents.	✓		✓	✓	✓	4

The Complex Number System

Perform arithmetic operations with complex numbers:

Code	Standard	Endurance	Leverage	Readiness	Assessment	Teacher Judgement	Total Score
HS.N-CN.1	Know there is an imaginary number i , such that $i^2 = -1$, and every complex number has the form $a + bi$ where a and b are real. Understand the hierarchical relationships among subsets of the complex number system.	✓		✓	✓	✓	4
HS.N-CN.2	Use the definition $i^2 = -1$ and the commutative, associative, and distributive properties to add, subtract, and multiply complex numbers.	✓		✓	✓	✓	4

Use complex numbers in polynomial identities and equations:

Code	Standard	Endurance	Leverage	Readiness	Assessment	Teacher Judgement	Total Score
HS.N-CN.7	Solve quadratic equations with real coefficients that have complex solutions.	✓		✓	✓	✓	4

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