

High School Algebra

The Mathematics Curriculum Framework represents the commitment of the Hinsdale School District to the Common Core State Standards and the ideas of Grant Wiggins and Jay McTighe in their principles of *Understanding by Design*. The Mathematics Curriculum Revision Committee (2015-16) believes that this document provides the necessary framework for teachers to develop mathematical units and lessons based on best practices in curriculum, instruction and assessment.

The Common Core State Standards for Mathematics requires that students develop a conceptual understanding of key concepts, procedural skills and fluency and the ability to use their knowledge to solve real world problems. Teachers are expected to develop lessons that meet these requirements by using a variety of instructional techniques and resources to meet individual student needs.

More information about the Common Core State Standards can be found at:

www.corestandards.org

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Standard A-SSE: Seeing Structure in Expressions

Interpret the structure of expressions.
Write expressions in equivalent forms to solve problems.

21st Century Learning Expectations:

Hinsdale students will take responsibility for their own learning.
Hinsdale students will demonstrate responsibility for their actions and choices.
Hinsdale students will be able to solve problems.

Enduring Understandings:

Real world situations can be represented symbolically and graphically.

Learning Competencies	Essential Questions
<p><i>Students will be able to</i></p> <ul style="list-style-type: none">• interpret expressions and parts of an expression that represent a quantity in terms of its context.• use the structure of an expression to identify ways to rewrite it.• use equivalent forms of expressions including factoring and equivalent forms of exponents to reveal and explain properties of the quantities represented by the expression.• derive the formula for the sum of a finite geometric series and use the formula to solve problems.	<ul style="list-style-type: none">• How do you use algebraic expressions to analyze or solve problems?• Why do we use variables?• When are algebraic and numeric expressions used?

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Standard A-APR: Arithmetic with Polynomials and Rational Expressions

- Perform arithmetic operations on polynomials.
- Understand the relationship between zeros and factors of polynomials.
- Use polynomial identities to solve problems.
- Rewrite rational expressions.

21st Century Learning Expectations:

- Hinsdale students will take responsibility for their own learning.
- Hinsdale students will demonstrate responsibility for their actions and choices.
- Hinsdale students will be able to solve problems.

Enduring Understandings:

- Polynomials are closed under the operations of addition, subtraction and multiplication.
- Solving polynomials involves the reversal of operations, the distributive property and the rules of exponents.

Learning Competencies	Essential Questions
<p><i>Students will be able to</i></p> <ul style="list-style-type: none">• add, subtract, and multiply polynomials and that afterward they remain polynomials.• state and apply the Remainder Theorem.• identify zeros of polynomials and use the zeros to construct a rough graph.• prove polynomial identities and use them to describe numerical relationships.• understand and apply the Binomial Expansion.• rewrite simple rational expressions in different forms using inspection, long division, or, for the more complicated examples, a computer algebra system.• add, subtract, and multiply rational expressions and that afterward they remain rational expressions.	<ul style="list-style-type: none">• In what ways can factoring polynomials be used to solve real life problems?• How are operations and properties of complex numbers related to real numbers?• How can we use the polynomial operations in real life?• How can patterns be used to understand and model mathematical situations?

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Standard A-CED: Creating Equations Create equations that describe numbers or relationships.	
21st Century Learning Expectations: Hinsdale students will take responsibility for their own learning. Hinsdale students will demonstrate responsibility for their actions and choices. Hinsdale students will be able to solve problems.	
Enduring Understandings: Equations and inequalities can be used to solve real world applications. Graphs and equations are related.	
Learning Competencies	Essential Questions
<p><i>Students will be able to</i></p> <ul style="list-style-type: none"> • create one and two variable equations and inequalities and use them to solve problems or graph equations. • write and solve system of equation problems in context. • rearrange formulas to highlight a quantity of interest, using the same reasoning as in solving equations. 	<ul style="list-style-type: none"> • How can you solve real life problems with graphs of linear equations? • How are graphs of linear inequalities helpful in solving problems? • Can solving systems of linear inequalities help businesses maximize profit and minimize cost?

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Standard A-REI: Reasoning with Equations & Inequalities

- Understand solving equations as a process of reasoning and explain the reasoning.
- Solve equations and inequalities in one variable.
- Solve systems of equations.
- Represent and solve equations and inequalities graphically.

21st Century Learning Expectations:

- Hinsdale students will take responsibility for their own learning.
- Hinsdale students will demonstrate responsibility for their actions and choices.
- Hinsdale students will be able to solve problems.

Enduring Understandings:

- Equations can be used to model real world situations.
- Inequalities and equations have similarities and differences.
- Patterns can help you understand mathematics and model situations.

Learning Competencies	Essential Questions
<p><i>Students will be able to</i></p> <ul style="list-style-type: none">explain the steps in solving a simple equation and solve a variety of equations in one variable.solve quadratic equations in one variable.derive the quadratic formula and recognize when it gives complex solutions.solve systems of equations consisting of linear and quadratic equations algebraically and graphically and represent linear equations as matrixes.understand that the graph of an equation in two variables is the set of all its solutions plotted in the coordinate plane, often forming a curve (which could be a line).explain why the x-coordinates of the points where two equations intersect are solutions for one equation equal to the other.graph the solutions to linear inequalities and systems of linear inequalities.	<ul style="list-style-type: none">How can slope and y-intercept help you graph a line?How can knowing the different forms of linear equations help you solve problems?How are graphs of linear equations used to solve real world problems?How are different forms of the equation of a line written so that they help solve real world problems?