

Virtual Learning Academy
Jefferson County Educational Service Center
Academic Content Standards
Algebra I

Algebra I Lesson 01 - Expressions, Variables, and Properties

Math 9 Algebra I Lesson 01 - Expressions, Variables, and Properties

Standard Benchmark and Indicator
S01. Number, Number Sense and Operations
C. Apply properties of operations and the real number system, and justify when they hold for a set of numbers. (08-10)
01. Identify and justify whether properties (closure, identity, inverse, commutative and associative) hold for a given set and operations; e.g., even integers and multiplication. (09)
G. Estimate, compute and solve problems involving real numbers, including ratio, proportion and percent, and explain solutions. (08-10)
04. Demonstrate fluency in computations using real numbers. (09)

Algebra I Lesson 02 - Expressions, Equations, and Inequalities

Math 9 Algebra I Lesson 02 - Expressions, Equations, and Inequalities

Standard Benchmark and Indicator
S04. Patterns, Functions and Algebra
D. Use algebraic representations, such as tables, graphs, expressions, functions and inequalities, to model and solve problem situations. (08-10)
11. Add, subtract, multiply and divide monomials and polynomials (division of polynomials by monomials only). (09)
F. Solve and graph linear equations and inequalities. (08-10)
06. Write and use equivalent forms of equations and inequalities in problem situations; e.g., changing a linear equation to the slope-intercept form. (09)
09. Solve linear equations and inequalities graphically, symbolically and using technology. (08)

Algebra I Lesson 03 - Integers and Equations

Math 9 Algebra I Lesson 03 - Integers and Equations

Standard Benchmark and Indicator
S01. Number, Number Sense and Operations
E. Compare, order and determine equivalent forms of real numbers. (08-10)
02. Compare, order and determine equivalent forms for rational and irrational numbers. (09)
G. Estimate, compute and solve problems involving real numbers, including ratio, proportion and percent, and explain solutions. (08-10)
04. Demonstrate fluency in computations using real numbers. (09)

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Algebra I Lesson 04 - Rational Numbers, Exponents, and Monomials

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Standard Benchmark and Indicator
S04. Patterns, Functions and Algebra
D. Use algebraic representations, such as tables, graphs, expressions, functions and inequalities, to model and solve problem situations. (08-10)
11. Add, subtract, multiply and divide monomials and polynomials (division of polynomials by monomials only). (09)
12. Simplify rational expressions by eliminating common factors and applying properties of integer exponents. (09)

Algebra I Lesson 05 - Polynomials

Math 9 Algebra I Lesson 05 - Polynomials

Standard Benchmark and Indicator
S04. Patterns, Functions and Algebra
D. Use algebraic representations, such as tables, graphs, expressions, functions and inequalities, to model and solve problem situations. (08-10)
11. Add, subtract, multiply and divide monomials and polynomials (division of polynomials by monomials only). (09)

Algebra I Lesson 06 - Review of Lessons #1 through #4

Algebra I Lesson 07 - Linear Functions

Math 9 Algebra I Lesson 07 - Linear Functions

Standard Benchmark and Indicator
S04. Patterns, Functions and Algebra
B. Identify and classify functions as linear or nonlinear, and contrast their properties using tables, graphs or equations. (08-10)
01. Define function with ordered pairs in which each domain element is assigned exactly one range element. (09)
I. Model and solve problem situations involving direct and inverse variation. (08-10)
14. Describe the relationship between slope and the graph of a direct variation and inverse variation. (09)
J. Describe and interpret rates of change from graphical and numerical data. (08-10)
15. Describe how a change in the value of a constant in a linear or quadratic equation affects the related graphs. (09)

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Algebra I Lesson 08 - Writing Equations of Lines

Math 9 Algebra I Lesson 08 - Writing Equations of Lines

Standard Benchmark and Indicator
S04. Patterns, Functions and Algebra
F. Solve and graph linear equations and inequalities. (08-10)
08. Find linear equations that represent lines that pass through a given set of ordered pairs, and find linear equations that represent lines parallel or perpendicular to a given line through a specific point. (09)

Algebra I Lesson 09 - Mid-Semester Test

Algebra I Lesson 10 - Systems of Equations

Math 9 Algebra I Lesson 10 - Systems of Equations

Standard Benchmark and Indicator
S04. Patterns, Functions and Algebra
H. Solve systems of linear equations involving two variables graphically and symbolically. (08-10)
09. Solve and interpret the meaning of 2 by 2 systems of linear equations graphically, by substitution and by elimination, with and without technology. (09)

Algebra I Lesson 11 - Systems of Equations

Math 9 Algebra I Lesson 11 - Systems of Equations

Standard Benchmark and Indicator
S04. Patterns, Functions and Algebra
H. Solve systems of linear equations involving two variables graphically and symbolically. (08-10)
09. Solve and interpret the meaning of 2 by 2 systems of linear equations graphically, by substitution and by elimination, with and without technology. (09)
11. Solve real-world problems that can be modeled, using systems of linear equations and inequalities. (10)

Algebra I Lesson 12 - Systems of Inequalities

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Standard Benchmark and Indicator
S04. Patterns, Functions and Algebra
H. Solve systems of linear equations involving two variables graphically and symbolically. (08-10)
09. Solve and interpret the meaning of 2 by 2 systems of linear equations graphically, by substitution and by elimination, with and without technology. (09)

Algebra I Lesson 13 - Law of Exponents

Math 9 Algebra I Lesson 13 - Law of Exponents

Standard Benchmark and Indicator
S04. Patterns, Functions and Algebra
D. Use algebraic representations, such as tables, graphs, expressions, functions and inequalities, to model and solve problem situations. (08-10)
07. Use formulas to solve problems involving exponential growth and decay. (09)

Algebra I Lesson 14 - Quotients of Monomials

Math 9 Algebra I Lesson 14 - Quotients of Monomials

Standard Benchmark and Indicator
S04. Patterns, Functions and Algebra
D. Use algebraic representations, such as tables, graphs, expressions, functions and inequalities, to model and solve problem situations. (08-10)
07. Use formulas to solve problems involving exponential growth and decay. (09)

Algebra I Lesson 15 - Exponential Functions

Math 9 Algebra I Lesson 15 - Exponential Functions

Standard Benchmark and Indicator
S04. Patterns, Functions and Algebra
D. Use algebraic representations, such as tables, graphs, expressions, functions and inequalities, to model and solve problem situations. (08-10)
07. Use formulas to solve problems involving exponential growth and decay. (09)

Algebra I Lesson 16 - Polynomials

Math 9 Algebra I Lesson 16 - Polynomials

Standard Benchmark and Indicator
S04. Patterns, Functions and Algebra

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D. Use algebraic representations, such as tables, graphs, expressions, functions and inequalities, to model and solve problem situations. (08-10)
11. Add, subtract, multiply and divide monomials and polynomials (division of polynomials by monomials only). (09)

Algebra I Lesson 17 - Factoring

Math 9 Algebra I Lesson 17 - Factoring

Standard Benchmark and Indicator
S04. Patterns, Functions and Algebra
G. Solve quadratic equations with real roots by graphing, formula and factoring. (08-10)
10. Solve quadratic equations with real roots by factoring, graphing, using the quadratic formula and with technology. (09)

Algebra I Lesson 18 - First Semester Exam

Algebra I Lesson 19 - Quadratics

Math 9 Algebra I Lesson 19 - Quadratics

Standard Benchmark and Indicator
S04. Patterns, Functions and Algebra
G. Solve quadratic equations with real roots by graphing, formula and factoring. (08-10)
10. Solve quadratic equations with real roots by factoring, graphing, using the quadratic formula and with technology. (09)

Algebra I Lesson 20 - More on Quadratics

Math 9 Algebra I Lesson 20 - More on Quadratics

Standard Benchmark and Indicator
S04. Patterns, Functions and Algebra
G. Solve quadratic equations with real roots by graphing, formula and factoring. (08-10)
10. Solve quadratic equations with real roots by factoring, graphing, using the quadratic formula and with technology. (09)

Algebra I Lesson 21 - Rational Expressions and Functions

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Standard Benchmark and Indicator



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02. Generalize patterns using functions or relationships (linear, quadratic and exponential), and freely translate among tabular, graphical and symbolic representations. (09)
B. Identify and classify functions as linear or nonlinear, and contrast their properties using tables, graphs or equations. (08-10)
01. Define function with ordered pairs in which each domain element is assigned exactly one range element. (09)

Algebra I Lesson 22 - Rational Expressions

Math 9 Algebra I Lesson 22 - Rational Expressions

Standard Benchmark and Indicator
S04. Patterns, Functions and Algebra
D. Use algebraic representations, such as tables, graphs, expressions, functions and inequalities, to model and solve problem situations. (08-10)
12. Simplify rational expressions by eliminating common factors and applying properties of integer exponents. (09)

Algebra I Lesson 23 - Operations with Radicals

Math 9 Algebra I Lesson 23 - Operations with Radicals

Standard Benchmark and Indicator
S01. Number, Number Sense and Operations
G. Estimate, compute and solve problems involving real numbers, including ratio, proportion and percent, and explain solutions. (08-10)
04. Demonstrate fluency in computations using real numbers. (09)

Algebra I Lesson 24 - Radical Equations

Math 9 Algebra I Lesson 24 - Radical Equations

Standard Benchmark and Indicator
S01. Number, Number Sense and Operations
E. Compare, order and determine equivalent forms of real numbers. (08-10)
02. Compare, order and determine equivalent forms for rational and irrational numbers. (09)
S03. Geometry and Spatial Sense
G. Prove or disprove conjectures and solve problems involving two- and three-dimensional objects represented within a coordinate system. (08-10)
03. Analyze two-dimensional figures in a coordinate plane; e.g., use slope and distance formulas to show that a quadrilateral is a parallelogram. (09)

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Algebra I Lesson 25 - The Distance Formula

Math 9 Algebra I Lesson 25 - The Distance Formula

Standard Benchmark and Indicator
S03. Geometry and Spatial Sense
G. Prove or disprove conjectures and solve problems involving two- and three-dimensional objects represented within a coordinate system. (08-10)
03. Analyze two-dimensional figures in a coordinate plane; e.g., use slope and distance formulas to show that a quadrilateral is a parallelogram. (09)

Algebra I Lesson 26 - Tangent, Sine, and Cosine

Math 9 Algebra I Lesson 26 - Tangent, Sine, and Cosine

Standard Benchmark and Indicator
S03. Geometry and Spatial Sense
I. Use right triangle trigonometric relationships to determine lengths and angle measures. (08-10)
01. Define the basic trigonometric ratios in right triangles: sine, cosine and tangent. (09)
02. Apply proportions and right triangle trigonometric ratios to solve problems involving missing lengths and angle measures in similar figures. (09)

Algebra I Lesson 27 – Mid-Semester Test

Algebra I Lesson 28 – Theoretical Probability

Math 9 Algebra I Lesson 28 - Theoretical Probability

Standard Benchmark and Indicator
S05. Data Analysis and Probability
I. Design an experiment to test a theoretical probability, and record and explain results. (08-10)
08. Describe, create and analyze a sample space and use it to calculate probability. (09)

Algebra I Lesson 29 – Probability

Math 9 Algebra I Lesson 29 - Probability

Standard Benchmark and Indicator
S05. Data Analysis and Probability
J. Compute probabilities of compound events, independent events, and simple dependent events. (08-10)
09. Identify situations involving independent and dependent events, and explain

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differences between, and common misconceptions about probabilities associated with those events. (09)

Algebra I Lesson 30 – Functions and Relations

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Standard Benchmark and Indicator
S04. Patterns, Functions and Algebra
E. Analyze and compare functions and their graphs using attributes, such as rates of change, intercepts and zeros. (08-10)
05. Describe and compare characteristics of the following families of functions: linear, quadratic and exponential functions; e.g., general shape, number of roots, domain, range, rate of change, maximum or minimum. (09)

Algebra I Lesson 31 – Proportions

Math 9 Algebra I Lesson 31 - Proportions

Standard Benchmark and Indicator
S01. Number, Number Sense and Operations
G. Estimate, compute and solve problems involving real numbers, including ratio, proportion and percent, and explain solutions. (08-10)
04. Demonstrate fluency in computations using real numbers. (09)
S02. Measurement
D. Use proportional reasoning and apply indirect measurement techniques, including right triangle trigonometry and properties of similar triangles, to solve problems involving measurements and rates. (08-10)
03. Use the ratio of lengths in similar two-dimensional figures or three-dimensional objects to calculate the ratio of their areas or volumes respectively. (09)

Algebra I Lesson 32 – Graphs

Math 9 Algebra I Lesson 32 - Graphs

Standard Benchmark and Indicator	Del?
and the (08-10)	-
02. Generalize patterns using functions or relationships (linear, quadratic and exponential), and freely translate among tabular, graphical and symbolic	X
B. Identify and classify functions as linear or nonlinear, and contrast their properties using tables, graphs or equations. (08-10)	X
03. Describe problem situations (linear, quadratic and exponential) by using tabular, graphical and symbolic representations. (09)	X
C. Translate information from one representation (words, table, graph or equation) to another representation of a relation or function. (08-10)	X

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C. Translate information from one representation (words, table, graph or equation) to another representation of a relation or function. (08-10)	✗
02. Generalize patterns using functions or relationships (linear, quadratic and exponential), and freely translate among tabular, graphical and symbolic representations. (09)	✗

Algebra I Lesson 33 – Scatter Plots

Math 9 Algebra I Lesson 33 - Scatter Plots

Standard Benchmark and Indicator	Del?
S05. Data Analysis and Probability	☐
A. Create, interpret and use graphical displays and statistical measures to describe data; e.g., box-and-whisker plots, histograms, scatter plots, measures of center and variability. (08-10)	✗
02. Create a scatterplot for a set of bivariate data, sketch the line of best fit, and interpret the slope of the line of best fit. (09)	✗
F. Construct convincing arguments based on analysis of data and interpretation of graphs. (08-10)	✗
06. Make inferences about relationships in bivariate data, and recognize the difference between evidence of relationship (correlation) and causation. (09)	✗

Algebra I Lesson 34 – Coordinate Proof

Math 9 Algebra I Lesson 34 - Coordinate Proof

Standard Benchmark and Indicator
S03. Geometry and Spatial Sense
G. Prove or disprove conjectures and solve problems involving two- and three-dimensional objects represented within a coordinate system. (08-10)
03. Analyze two-dimensional figures in a coordinate plane; e.g., use slope and distance formulas to show that a quadrilateral is a parallelogram. (09)

Algebra I Lesson 35 – Similarity

Math 9 Algebra I Lesson 35 - Similarity

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dimensional objects to calculate the ratio of their areas or volumes respectively. (09)

S03. Geometry and Spatial Sense

I. Use right triangle trigonometric relationships to determine lengths and angle measures. (08-10)

02. Apply proportions and right triangle trigonometric ratios to solve problems involving missing lengths and angle measures in similar figures. (09)

Algebra I Lesson 36 – Final Exam