

USD 312

Algebra I

Standard 1: Students will use number sense in a variety of situations.

Indicators of Performance:

Students will -

- S 1. name, use, and describe these properties with the real number system and demonstrates their meaning including the use of concrete objects: commutative, associative, distributive, and substitution properties; identity properties for addition and multiplication; inverse properties of addition and multiplication; symmetric property of equality; addition and multiplication properties of equality and inequality; zero product property
- 05S 2. use equivalent representations for the same real number and/or algebraic expression including integers, decimals, fractions, percents, ratios, scientific notation, and numbers with integer exponents
- S 3. analyze and evaluate the advantages and disadvantages of using integers, whole numbers, fractions (including mixed numbers), decimals or irrational numbers and their rational approximations in solving a given real-world problem
- S 4. adjust an original rational number estimate of real-world problem based on additional information (a frame of reference)
- 5. determine whether a situation calls for an exact or approximate value

Standard 2: Students will use computation in a variety of situations.

Indicators of Performance:

Students will -

- S 1. generate and/or solve multi-step real-world problems with real numbers and algebraic expressions using computational procedures and mathematical concepts with: applications from business, chemistry, and physics that involve addition, subtraction, multiplication, division, squares, powers, exponents, and square roots when the formulae are given as part of the problem and variables are defined; volume and surface area given the measurement formulas; application of percents
- 05S 2. find prime factors, greatest common factor, multiples, and the least common multiple of algebraic expressions and real numbers
- SN 3. perform and explain these computational procedures: addition, subtraction, multiplication, and division using the order of operations
- 4. state and apply the formula for distance on a number line
- 5. multiply and divide monomials and polynomials and combine like terms

S preceding an indicator means it is a state assessed item.

SN preceding an indicator means it is a non-calculator state assessed item.

05S preceding an indicator means it is a state assessed item through spring 2005 only.

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Standard 3: Students will use algebraic concepts in a variety of situations.

Indicators of Performance:

Students will -

- 05S 1. recognize the generalization of a pattern using symbolic notation to represent the n th term in explicit form
- S 2. solve systems of linear equations with two unknowns using integer coefficients and constants
- SN 3. represent and/or solve real-world problems with linear equations and inequalities both analytically and graphically
- 05SN 4. set up and solve: factorable quadratic equations; radical equations with no more than one inverse operation around the radical expression; exponential equations containing the same base; equations and inequalities containing absolute value quantities containing one variable
- S 5. recognize how changes in the constant and/or slope within a linear function changes the appearance of a graph
- S 6. interpret the meaning of the x - and y -intercepts, slope, and/or points on and off the line of a graph in the context of a real-world situation
- S 7. recognize that various mathematical models can be used to represent the same problem situation (models include: scale drawings to model large and small real-world objects; geometric models (spinners, targets, or number cubes), process models (coins, pictures, or diagrams), tree diagrams to model probability; frequency tables, bar graphs, line graphs, circle graphs, Venn diagrams, charts, tables, single and double stem-and-leaf plots, scatter plots, box-and-whisker plots, histograms, and matrices to describe, interpret and analyze data
- 8. use function notation
- 9. identify the domain and range of a function
- 10. reverse x - and y -values to identify the new domain and range for the inverse of a function

Standard 4: Students will use geometry in a variety of situations.

Indicators of Performance:

Students will –

- S 1. solve real-world problems by applying the Pythagorean Theorem
- S 2. find and explain the relationship between the slopes of parallel and perpendicular lines

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- S 3. recognize the equation of a line and transforms the equation into slope-intercept form in order to identify the slope and y-intercept and uses this information to graph the line
- 4. graph linear inequalities or systems of linear inequalities on a coordinate plane
- 5. determine the midpoint of a segment given two endpoints
- 6. determine if a point lies on a line without graphing
- 7. represent areas of regions using variables

Standard 5: Students will use statistics in a variety of situations.

Indicators of Performance:

Students will -

- S 1. approximate a line of best fit given a scatter plot and makes predictions using the equation of that line
- 05S 2. recognize or explain the affects of scale and/or interval changes on graphs of data sets
- S 3. use data analysis (mean, median, mode, range, quartile, interquartile range) in real-world problems with rational number data sets to compare and contrast two sets of data, to make accurate inferences and predictions, to analyze decisions, and to develop convincing arguments from these data displays: frequency tables; bar, line, and circle graphs; Venn diagrams or pictorial displays; charts and tables; stem-and-leaf plots (single and double); scatter plots; box-and-whisker plots; histograms

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