

INDIAN HILL EXEMPTED VILLAGE SCHOOL DISTRICT
Mathematics Curriculum - May 2009
High School – Algebra I Concepts

Main Idea: Properties. Collecting and Displaying Data

Skills & Objectives:

- Identify and justify whether properties (closure, identity, inverse, commutative and associative) hold for a given set and operations; e.g., even integers and multiplication.
- Demonstrate fluency in computations using real numbers.

Main Idea: Integers

Skills & Objectives:

- Identify and justify whether properties (closure, identity, inverse, commutative and associative) hold for a given set and operations; e.g., even integers and multiplication.

Main Idea: Addition and Subtraction Equations

Skills & Objectives:

- Identify and justify whether properties (closure, identity, inverse, commutative and associative) hold for a given set and operations; e.g., even integers and multiplication.
- Explain the effects of operations such as multiplication or division, and of computing powers and roots on the magnitude of quantities.
- Explain the meaning of the n th root.
- Approximate the n th root of a given number greater than zero between consecutive integers when n is an integer; e.g., the 4th root of 50 is between 2 and 3.

Main Idea: Multiplication and Division Equations

Skills & Objectives:

- Identify and justify whether properties (closure, identity, inverse, commutative and associative) hold for a given set and operations; e.g., even integers and multiplication.
- Compare, order and determine equivalent forms for rational and irrational numbers.

Main Idea: Proportional Reasoning and Probability

Skills & Objectives:

- Identify and justify whether properties (closure, identity, inverse, commutative and associative) hold for a given set and operations; e.g., even integers and multiplication.
- Model and solve problems involving direct and inverse variation using proportional reasoning.
- Describe the relationship between slope and the graph of a direct variation and inverse variation.
- Model problems dealing with uncertainty with area models (geometric probability).
- Differentiate and explain the relationship between the probability of an event and the odds of an event, and compute one given the other.

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Main Idea: Functions and Graphs

Skills & Objectives:

- Define function with ordered pairs in which each domain element is assigned exactly one range element.
- Describe problem situations (linear, quadratic and exponential) by using tabular, graphical and symbolic representations.
- 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.
- Write and use equivalent forms of equations and inequalities in problem situations; e.g., changing a linear equation to the slope-intercept form.
- 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.
- Model and solve problems involving direct and inverse variation using proportional reasoning.
- Describe the relationship between slope and the graph of a direct variation and inverse variation.
- Define function formally and with $f(x)$ notation.
- Describe and compare characteristics of the following families of functions: square root, cubic, absolute value and basic trigonometric functions; e.g., general shape, possible number of roots, domain and range.
- Solve real-world problems that can be modeled using linear, quadratic, exponential or square root functions.
- Recognize and explain that the slopes of parallel lines are equal and the slopes of perpendicular lines are negative reciprocals.
- Describe the relationship between slope of a line through the origin and the tangent function of the angle created by the line and the positive x -axis.
- Solve simple linear and nonlinear equations and inequalities having square roots as coefficients and solutions.

Main Idea: Linear Equations

Skills & Objectives:

- Generalize patterns using functions or relationships (linear, quadratic and exponential), and freely translate among tabular, graphical and symbolic representations.
- Define function with ordered pairs in which each domain element is assigned exactly one range element.
- Write and use equivalent forms of equations and inequalities in problem situations; e.g., changing a linear equation to the slope-intercept form.
- 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.
- 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.