

Main Idea: Real numbers and solving equations. Functions and graphs

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.
- Explain the effects of operations such as multiplication or division, and of computing powers and roots on the magnitude of quantities.
- Define function with ordered pairs in which each domain element is assigned exactly one range element.
- 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.
- Describe how a change in the value of a constant in a linear or quadratic equation affects the related graphs.

Main Idea: Linear systems and matrices

Skills & Objectives:

- Solve and interpret the meaning of 2 by 2 systems of linear equations graphically, by substitution and by elimination, with and without technology.

Main Idea: Quadratic equations and functions

Skills & Objectives:

- Solve quadratic equations with real roots by factoring, graphing, using the quadratic formula and with technology.

Main Idea: Polynomials and polynomial functions

Skills & Objectives:

- Add, subtract, multiply and divide monomials and polynomials (division of polynomials by monomials only).

Main Idea: Radical, Exponential, and Logarithmic functions

Skills & Objectives:

- Use formulas to solve problems involving exponential growth and decay.

Main Idea: Rational functions

Skills & Objectives:

- Simplify rational expressions by eliminating common factors and applying properties of integer exponents

Main Idea: Quadratic relations

Skills & Objectives:

- Generalize patterns using functions or relationships (linear, quadratic and exponential), and freely translate among tabular, graphical and symbolic representations.
- Demonstrate the relationship among zeros of a function, roots of equations, and solutions of equations graphically and in words.
- 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.

Main Idea: Periodic functions and trigonometry

Skills & Objectives:

- Define the basic trigonometric ratios in right triangles: sine, cosine and tangent.
- Apply proportions and right triangle trigonometric ratios to solve problems involving missing lengths and angle measures in similar figures.