

Teaching Unit: **Linear Functions**

Essential Understandings

* Review of Functions and relations and operations with functions.

Sub Topic:

Knowledge and Skills

Determine whether a given relation is a function
Identify the domain and range of a relation or function
Evaluate functions
Perform operations with functions
Find composite functions
Iterate functions using real numbers
Graph linear equations
Find the x- and y- intercepts of a line
Find the slope of a line through two points
Find zeros of linear functions
Write linear equations
Write equations of parallel and perpendicular lines
Draw and analyze scatter plots
Write a prediction equation and draw line of best fit lines.
Use a graphing calculator/computer program to compute correlation coefficients to determine goodness of fit.
Solve problems using prediction equations models.
Identify and graph piece wise functions including greatest integer, step, and absolute value functions.
Graph linear inequalities

Teaching Unit: **Matrices**

Essential Understandings

There are many ways to organize our every day lives. How will matrices help us to organize those components?

Sub Topic: **Transformations**

Knowledge and Skills

Model data using matrices
Add, subtract & multiply matrices
Determine the effect of matrix multiplication on a vertex matrix
Use matrices to determine the coordinates of polygons under a given transformation
Evaluate determinants
Find the inverses of matrices
Solve systems of equations by using the inverses of matrices

Teaching Unit: ***Functions - The nature of graphs***

Essential Understandings

Families of graphs have many commonalities.

Sub Topic:

Knowledge and Skills

Use algebraic tests to determine whether the graph of a relation is symmetrical
Classify functions as even or odd
Identify transformation of simple graphs
Sketch graphs of related functions
Graph polynomial, absolute value, and radical inequalities in two variables
Solve absolute value inequalities
Determine inverses of relations and functions
Graph functions and their inverses
Determine whether a function is continuous or discontinuous
Identify the end behavior of functions
Determine whether a function is increasing or decreasing on an interval
Construct and graph functions with gap discontinuities
Find the extrema of a function
Graph rational functions
Determine vertical, horizontal and slant asymptotes
Solve problems involving direct, inverse, and joint variation

Teaching Unit: *Trigonometry*

Essential Understandings

Focus on the relationship among various trigonometric functions and their graphs.

Sub Topic:

Knowledge and Skills

*Convert decimal degree measure to degree/minute/second & vice versa
Find the number of degree in given rotations
Identify angles that are co-terminal
Find values of trigonometric ratios for acute angles of right triangles
Find the values of 6 trig functions using unit circles
Find the values of 6 trig functions of an angle in standard position given a point on its terminal side.
Use trig to find the measures of the sides of right triangles
Evaluate inverse trig functions
Find missing angle measurements
Solve right triangles
Solve triangles by using Law of Sines if the measures of two angles and a side are given.
Find the area of a triangle if the measures of two sides and the included angle or the measures of two angles and a side are given.
Determine whether a triangle has zero, 1 or 2 solutions.
Solve triangles using the Law of Sines
Solve triangles using the Law of Cosines
Find the area of triangles if the measure of the 3 sides are given
Find Linear & Angular Velocities

Teaching Unit: ***Polynomial Functions***

Essential Understandings

Many situations in the real world cannot be modeled with first-degree equations. They require the use of functions that are not linear.

Sub Topic:

Knowledge and Skills

Determine roots of polynomial equations.
Apply the Fundamental Theorem of Algebra.
Solve quadratic equations.
Use the discriminant to describe the roots of quadratic equations.
Find the factors of polynomials using the Remainder and Factor theorem.
Identify all possible rational roots of a polynomial equations by using the Rational Root Theorem.
Determine the number of positive and negative real roots a polynomial functions has.
Approximate the real zeros of a polynomial functions.
Solve rational equations and inequalities.
Decompose a fractions into partial fractions.
Solve radical equations and inequalities.
Write polynomial functions to model & interpret real-world data.

Teaching Unit: ***Exponential & Logarithms***

Essential Understandings

The relationship between exponents and logarithms.

Sub Topic:

Knowledge and Skills

Use the properties of exponents.
Evaluate and simplify expressions containing rational exponents.
Solve equations containing rational exponents.
Graph exponential functions and inequalities.
Solve problems involving exponential growth and decay, and doubling time.
Evaluate expressions involving logarithms.
Solve equations and inequalities involving logarithms and natural logarithms.
Graph logarithmic functions and inequalities.
Find common logarithms, natural logarithms and antilogarithms of numbers.
Solve equations and inequalities using common logarithms.
Solve real-world applications with common and natural logarithm functions.
Find exponential and logarithmic functions to model real-world data.
Linearize data.

Teaching Unit: ***Complex Numbers***

Essential Understandings

The purpose of complex numbers and how they appear in our everyday lives.

Sub Topic: ***Polar Coordinates***

Knowledge and Skills

Add, subtract, multiply and divide complex numbers in rectangular form.
Graph complex numbers in the complex plane.
Convert complex numbers from rectangular to polar form and vice versa.

Teaching Unit: ***Statistics***

Essential Understandings

There are several methods to display data.

Sub Topic:

Knowledge and Skills

Draw, analyze, and use bar graphs and histograms.
Organize data into a frequency distribution table.
Find the mean, median, and mode of a set of data.
Find the measures of central tendency of data organized in a step-leaf plot or a frequency table.
Find the inter quartile range, the semi-inter quartile range, mean deviation, and standard deviation of a set of data.
Organize and compare data using a box-and-whisker plots.
Use the normal distribution curve.
Find the standard error of the mean to predict the true mean of a population with a certain level of confidence.
