

Teaching Unit: **Functions-Review**

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: **Sequences & Series**

Essential Understandings

The review of Arithmetic and Geometric sequences will lead into infinite series and sequences which directly leads to the discussion of Limits.

Sub Topic: **Limits**

Knowledge and Skills

Find the nth term and arithmetic means of arithmetic & Geometric sequences.
Find the sum of n terms of an arithmetic, geometric & infinite series.
Find the limit of terms of infinite sequences.
Find the sum of an infinite geometric series.
Explore sequences generated by continued fractions.
Determine whether a series is convergent or divergent.
Use sigma notation.
Use the Binomial theorem to expand binomials.
Approximate e^x , trig values, and logs of negative numbers by using series.
Iterate functions using real and complex numbers.

Teaching Unit: **Limits**

Essential Understandings

The topic of Limit is fundamental to the main subjects of calculus: the derivative and the integral. Although the topics of limit and continuity are rather theoretical in nature, we will present them as concretely and pictorially as possible.

Sub Topic:

Knowledge and Skills

Evaluate the limit of a constant, a polynomial, and infinite limit.
Determine when a limit doesn't exist.
Determine one sided and infinite limits.
Determine the limits of trigonometric functions.

Teaching Unit: **Derivatives**

Essential Understandings

To see the connection between derivatives and the slope of tangent lines to functions.

Sub Topic:

Knowledge and Skills

Find the derivatives of constants, monomials, binomials, polynomials?
Use derivatives to determine initial velocities?
Use the the Chain rule to find derivatives of more complicated problems.
Use implicit differentiation?
Use derivatives to find extreme values?
Use derivatives to determine exponential growth and decay problems?
