Unit 01: Functions

Content Area: **Mathematics**
Course(s): **PreCalc Trig H**
Time Period: **Semester 1**
Length: **2 weeks**
Status: **Published**

Standards - NJCCS/CCSS

CCSS.Math.Content.HSF-IF.A	Understand the concept of a function and use function notation
CCSS.Math.Content.HSF-IF.A.1	Understand that a function from one set (called the domain) to another set (called the range) assigns to each element of the domain exactly one element of the range. If f is a function and x is an element of its domain, then $f(x)$ denotes the output of f corresponding to the input x. The graph of f is the graph of the equation $y = f(x)$.
CCSS.Math.Content.HSF-IF.A.2	Use function notation, evaluate functions for inputs in their domains, and interpret statements that use function notation in terms of a context.
CCSS.Math.Content.HSF-IF.B.5	Relate the domain of a function to its graph and, where applicable, to the quantitative relationship it describes.
CCSS.Math.Content.HSF-IF.C.7	Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases.
CCSS.Math.Content.HSF-IF.C.7.a	Graph linear and quadratic functions and show intercepts, maxima, and minima.
CCSS.Math.Content.HSF-IF.C.7.b	Graph square root, cube root, and piecewise-defined functions, including step functions and absolute value functions.
CCSS.Math.Content.HSF-IF.C.8.a	Use the process of factoring and completing the square in a quadratic function to show zeros, extreme values, and symmetry of the graph, and interpret these in terms of a context.
CCSS.Math.Content.HSF-BF.A.1.b	Combine standard function types using arithmetic operations.
CCSS.Math.Content.HSF-BF.A.1.c	Compose functions.
CCSS.Math.Content.HSF-BF.B.3	Identify the effect on the graph of replacing $f(x)$ by $f(x) + k$, $k\ f(x)$, $f(kx)$, and $f(x + k)$ for specific values of k (both positive and negative); find the value of k given the graphs. Experiment with cases and illustrate an explanation of the effects on the graph using technology.
CCSS.Math.Content.HSF-BF.B.4	Find inverse functions.
CCSS.Math.Content.HSF-BF.B.4.b	Verify by composition that one function is the inverse of another.
CCSS.Math.Content.HSF-BF.B.4.c	Read values of an inverse function from a graph or a table, given that the function has an inverse.

Enduring Understandings

Symbols are useful in mathematics.

Mathematical relationships can be expressed in various forms (equations, graphs, tables, etc).

Essential Questions

What is the definition of a function?

How can one determine if a relation, graph, or equation represents a function?

What is an inverse and how does it compare to a function graphically?

Knowledge and Skills

SWBAT identify whether relations, graphs, or equations represent functions.

SWBAT state domain and range of functions.

SWBAT graph parent functions.

SWBAT graph translations, reflections, and transformations to parent functions.

SWBAT graph functions with restricted domains.

SWBAT graph piecewise functions.

SWBAT perform operations on functions.

SWBAT find the domain of algebraic functions.

SWBAT graph algebraic functions (sum, difference, and product of functions) with proper domain.

SWBAT evaluate composite functions.

SWBAT find the inverse of a function algebraically and graphically.

Resources

Precalculus with Limits

Authors: Aufmann, Barker, Nation

Graphing Calculator

www.desmos.com

www.flipgrid.com

www.graphfree.com