Instruction

Prerequisite Skills

This lesson requires the use of the following skills:

- substituting values for the variables
- understanding domain and range

Introduction

So far we have seen a function f of a variable x represented by $f(x)$. We have graphed $f(x)$ and learned that its range is dependent on its domain. But, can a function be applied to expressions other than x? What would it mean if we wrote $f(2x)$ or $f(x + 1)$? In this lesson, we will explore function notation and the versatility of functions.

For example, let f be a function with the domain {1, 2, 3} and let $f(x) = 2x$. To evaluate f over the domain {1, 2, 3}, we would write the following equations by substituting each value in the domain for x:

$f(1) = 2(1) = 2$

$f(2) = 2(2) = 4$

$f(3) = 2(3) = 6$

{2, 4, 6} is the range of $f(x)$.

Key Concepts

- Functions can be evaluated at values and variables.
- To evaluate a function, substitute the values for the domain for all occurrences of x.
- To evaluate $f(2)$ in $f(x) = x + 1$, replace all x's with 2 and simplify: $f(2) = (2) + 1 = 3$. This means that $f(2) = 3$.
- $(x, (f(x))$ is an ordered pair of a function and a point on the graph of the function.

Common Errors/Misconceptions

- thinking function notation means "f times x" instead of "f of x"
- trying to multiply the left side of the function notation