

Module 1: Searching for Patterns

TOPIC 1: QUANTITIES AND RELATIONSHIPS

In this topic, students explore a variety of different functions. The intent is merely to introduce these new functions, providing an overview but not a deep understanding at this point. The topic is designed to help students recognize that different function families have different key characteristics. In later study in this course, they will formalize their understanding of the defining characteristics of each type of function.

Where have we been?

In previous grades, students defined a function and used linear functions to model the relationship between two quantities. They have written linear functions in slope-intercept form and should be able to identify the slope and y -intercept in the equation. Students have also characterized graphs as functions using the terms *increasing*, *decreasing*, *constant*, *discrete*, *continuous*, *linear*, and *nonlinear*.

Where are we going?

The study of functions is a main focus of high school mathematics. This topic builds the foundation for future, more in-depth study by familiarizing students with the concept of a function. Students will continue to use formal function notation throughout this course and in higher-level math courses.

Function Notation

The linear equation $y = 8x + 15$ can be written to represent a relationship between the variables x and y . You can write this linear equation as a function with the name f to represent it as a mathematical object that has a specific set of inputs (the domain of the function) and a specific set of outputs (the range of the function).

The diagram shows the equation $f(x) = 8x + 15$. An arrow points from the text "name of function" to the f in $f(x)$. Another arrow points from the text "independent variable" to the x in $f(x)$.

The input of the function, x , is represented by a single variable, but this variable often represents a whole collection of values.

