# High School Algebra Playlist: Understanding Functions

Aligns with 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*).

## Related Standards

- 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.

## Objectives

In this module, you will learn and practice the following skills:

- understand that a function is a mapping from an element in the domain to an element in the range
- distinguish between functions and relations

Let's get started!

## Key Terms

- A **relation** is a set of input and output values, usually expressed as ordered pairs.
- **Ordered pairs** contain two values, with their position implying their meaning.
- A **function** is a relation which has each input related to exactly one output.
- The **domain** of a function is the set of input values.
- The **range** of a function is the set of output values.
- The **vertical-line test** offers a visual way to determine whether a graph shows a function.

## Connections

- https://openstaxcollege.org/textbooks/algebra-and-trigonometry; section 3.1
- https://openstaxcollege.org/textbooks/algebra-and-trigonometry; section 3.2

# Understanding Functions

(CCSS.Math.Content.HSF.IF.A.1)

A **relation** is a set of input and output values, usually expressed as ordered pairs. **Ordered pairs** contain two values, with their position implying their meaning. A **function** is a relation which has each input related to exactly one output. The **domain** of a function is the set of input values. The **range** of a function is the set of output values. The **vertical-line test** offers a visual way to determine whether a graph shows a function.

If your students…

**Mishandle the vertical-line test or think that shapes, such as circles, are functions:**

WATCH: Vertical Line Test

https://www.opened.com/video/vertical-line-test/871969

**Confuse relations with functions:**

Emphasize that it is okay for multiple *x* values to map to a single *y* value (as in $y = |x|$), but that a relation is not a function if a particular *x* value maps to different *y* values.

**Confuse domain and range:**

Students think of "range" in its common English usage as meaning a variety of values, so they often get **domain** and **range** confused. Remind them that these pairs are each in alphabetic order:

Domain, *x*, horizontal, input

Range, *y*, vertical, output