

High School Algebra Playlist: Relating the Domain of a Function to its Graph

Aligns with [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. *For example, if the function $h(n)$ gives the number of person-hours it takes to assemble n engines in a factory, then the positive integers would be an appropriate domain for the function*

Related Standards

- [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.B.4](#): For a function that models a relationship between two quantities, interpret key features of graphs and tables in terms of the quantities, and sketch graphs showing key features given a verbal description of the relationship. *Key features include: intercepts; intervals where the function is increasing, decreasing, positive, or negative; relative maximums and minimums; symmetries; end behavior; and periodicity.*

PREVIEW



Objectives

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

- relate the domain of a function to its graph
- understand the appropriate domain for a function modeling a situation

Let's get started!

Key Terms

- 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.

Connections

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

PREVIEW



Relating the Domain of a Function to its Graph

([CCSS.Math.Content.HSF.IF.B.5](#))

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.

If your students...

Mishandle restrictions on the domain of a function:

A typical problem is to think of the domain of a function as “all reals” when the function is actually restricted to non-negative values or to integers. Remind students that they can’t count a quarter of a person.

WATCH: Evaluate mathematical situations by analyzing the domain and range of functions

https://learnzillion.com/lesson_plans/4659#fndtn-lesson

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

Assume a function is continuous and misidentify the range:

Many functions that appear to be continuous really are step functions. If a boat-rental place advertises its prices as “\$10, plus \$3 per hour or portion thereof”, then the graph of time vs. price is not a straight line – it is a step function. So the range of the function is not all non-negative reals but 13, 16, 19, 22, etc.

