

## High School Algebra Playlist: Interpreting Relationships between Quantities

Aligns with [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.*

### 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  $y = f(x)$ .

PREVIEW



## Objectives

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

- interpret graphs and tables to understand key features in the relationship between two quantities
- sketch a graph showing key features of the relationship

Let's get started!

## Key Terms

- The **x-intercept** is the point at which the graph of an equation intersects the x-axis.
- The **y-intercept** is the point at which the graph of an equation intersects the y-axis.
- An **interval** is what lies between two points.
- The **end-behavior** of a function is its behavior as  $x$  approaches positive or negative infinity.
- A **relative maximum** or **relative minimum** is the high or low point of a portion of a graph.

## Connections

- <https://openstaxcollege.org/textbooks/algebra-and-trigonometry>; section 2.1.4



## Interpreting Relationships between Quantities

([CCSS.Math.Content.HSF.IF.B.4](#))

The  **$x$ -intercept** is the point at which the graph of an equation intersects the  $x$ -axis. The  **$y$ -intercept** is the point at which the graph of an equation intersects the  $y$ -axis. An **interval** is what lies between two points. The **end-behavior** of a function is its behavior as  $x$  approaches positive or negative infinity. A **relative maximum** or **relative minimum** is the high or low point of a portion of a graph.

If your students...

### Confuse $x$ -intercept and $y$ -intercept:

Many students know that the  $y$ -intercept often represents the “starting” condition, especially in a situation in which  $x$  represents time. But they confuse the  $x$ -intercept with the  $y$ -intercept, and they’re unable to articulate what the  $x$ -intercept then means.

WATCH: X-Intercepts and Y-Intercepts of a Functions and Finding Them! Example 1

<http://patrickjmt.com/x-intercepts-and-y-intercepts-of-a-functions-and-finding-them-example-1/>

### Cannot relate the intercepts to the situation:

Students can find the points representing the intercepts, but they can’t describe what those points mean in the context of the problem. Ask them what they have graphed, and have them explain exactly what the  $x$  and  $y$  values represent. It’s not enough for  $x$  to mean “students” – does  $x$  show the average weight of a student? The cost to educate a student for one year? Or the number of students making a purchase?

