High School Algebra Playlist: Parsing Expressions

Aligns with CCSS.Math.Content.HSA.SSE.A.1.b: Interpret complicated expressions by viewing one or more of their parts as a single entity. *For example, interpret $P(1+r)^n$ as the product of P and a factor not depending on P*.

Related Standards

- CCSS.Math.Content.HSA.SSE.A.1: Interpret expressions that represent a quantity in terms of its context.
- CCSS.Math.Content.HSA.SSE.A.1.a: Interpret parts of an expression, such as terms, factors, and coefficients.
- CCSS.Math.Content.HSA.CED.A.1: Create equations and inequalities in one variable and use them to solve problems. *Include equations arising from linear and quadratic functions, and simple rational and exponential functions*.

Objectives

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

- parse an expression into its different factors, depending on its variables
- understand how different variables correspond to different quantities and affect the expression as they change in value

Let's get started!

Key Terms

- An **expression** is a mathematical phrase that contains terms that are added and subtracted.
- A **term** describes the parts of an expression that are added or subtracted; each term contains two or more factors.
- A **factor** is a number that is multiplied by another number or by an expression to make a product.
- A **variable** is a letter that is used to represent a number.

Connections

- https://openstaxcollege.org/textbooks/algebra-and-trigonometry; section 1.6

Parsing Expressions

(CCSS.Math.Content.HSA.SSE.A.1.b)

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If your students…

Mishandle separate factors:

Watch for mathematical errors in simplifying and in combining terms. Some students will mistakenly treat an expression such as $(2x + 1)y$ as an implied addition, not a multiplication. Then, they may realize that increasing y increases the value of the expression, but they will believe it does so arithmetically, not geometrically. And some students may look at $3a + 3b$ and believe that it is equivalent to $3ab$ or even $6ab$, again with bogus conclusions about how the changing value of a or b affects the value of the entire expression.

Mishandle how expressions change:

The standard implies an understanding of how the value of an expression changes as its components change – as variables change in value. Some students have trouble considering what happens when variables are in the denominator of an expression. It may help them to think about the graph of $y = \frac{1}{x}$.

Have the students determine what happens as x "gets big" (i.e. nears ∞) or as x decreases from 1 to near 0. And what is the value of the expression when x is a number such as −10,000?

These other resources will be of use to you; they are intended for teachers and provide additional context for presenting the material to students:

- https://www.illustrativemathematics.org/HSA-SSE.A.1
- http://betterlesson.com/common_core/browse/569/ccss-math-content-hsa-sse-a-1b-interpret-complicated-expressions-by-viewing-one-or-more-of-their-parts-as-a-single-entity-for-ex