

Grade 9-12 Unpacked Core Math Standards - Algebra

9-12.A.1.1 Students are able to **write** equivalent forms of algebraic expressions **using** properties of the set of real numbers.

Webb Level: 1

Bloom: Comprehension

Verbs Defined:

Write: determine

Using: applying

Key terms defined:

Equivalent forms: Having the same value when evaluated.

Algebraic expressions: A mathematical combination of numbers, variables, and operations. It is **not** an equation.

Properties of real numbers: A set of mathematical rules or laws that results in an equivalent expression.

Real Number: Any number that can be graphed on the number line. This includes integers and rational numbers.

Teacher Speak:

Students are able to write (determine) equivalent forms of algebraic expressions using (applying) properties of the set of real numbers.

Student Speak:

- I can apply (use) the laws of exponents to simplify algebraic expressions (A mathematical combination of numbers, variables, and operations. It is **not** an equation.).
- Given the values of variables, I can evaluate algebraic expressions (A mathematical combination of numbers, variables, and operations. It is **not** an equation.).
- I can apply (use) the order of operations to simplify algebraic expressions (A mathematical combination of numbers, variables, and operations. It is **not** an equation.).
- I can combine like terms.
- I can multiply polynomials.
- I can apply (use) the distributive property to simplify algebraic expressions (A mathematical combination of numbers, variables, and operations. It is **not** an equation.).
- I can factor out a common term.
- I can determine (write) algebraic expressions (A mathematical combination of numbers, variables, and operations. It is **not** an equation.) from verbal statements.

9-12.A.2.1. Students are able to **use** algebraic properties to **transform** multi-step, single-variable, first-degree equations.

Webb Level: 2

Bloom: Comprehension

Verbs Defined:

Use: Apply

Transform: solve

Key terms defined:

Algebraic properties: A set of mathematical rules or laws that results in an equivalent equation.

Multi-step: Equations that require more than 2 steps to solve.

First degree: Variables are to the first power when the equation is written in simplified form.

Single variable: An equation limited to one variable.

Equation: A mathematical sentence in which the two expressions are equivalent.

Teacher Speak:

Students are able to use (apply) algebraic properties to transform (solve) multi-step, single-variable, first-degree equations.

Student Speak:

I can solve equations (A mathematical sentence in which the two expressions are equivalent) that:

- Have all the variables on one side.
- Have variables on both sides.
- Require the distributive property to simplify one or both sides.
- Require more than two steps to solve.

9-12.A.3.1. Students are able to **create** linear models to **represent** problem situations.

Webb Level: 2

Bloom: Application

Verbs Defined:

Create: Write

Represent: model, portray

Key terms defined:

Linear model: A representation of a problem that can be expressed as an equation in the form $y = mx + b$ where m represents the constant rate of change, or slope, and b represents some fixed value, or the y -intercept.

Problem Situation: A setting in which to find an unknown.

Teacher Speak:

Students are able to create (write) linear equations that represent (portray) problem situations.

Student Speak:

Given a problem situation (setting in which to find an unknown):

- I can write (create) an equation.
- I can find the rate of change (slope).
- I can find the y-intercept.
- I can explain the meaning of the x- and/or y-intercept.
- I can make predictions using the linear equation (model: A representation of a problem that can be expressed as an equation in the form $y = mx + b$ where m represents the constant rate of change, or slope, and b represents some fixed value, or the y-intercept.) that I wrote.

9-12.A.4.1 Students are able to **use graphs, tables and equations to represent linear functions.**

Webb Level: 2

Bloom: Application

Verbs Defined:

Use: Create.

Represent: model

Key terms defined:

Graphs: Pictorial representation of data or an equation.

Table: A way of expressing domain & range in a row and column in a horizontal, vertical or T table format.

Equation: Mathematical statement that 2 expressions are equivalent.

Linear function: A function of the form $f(x) = mx + b$ where m and b are some fixed numbers, representing slope and y-intercept. Functions of this kind are called “linear” because their graphs are lines. This can also be written in point-slope

($y - y_o = m(x - x_o)$) and standard form ($Ax + By = C$).

Teacher Speak:

Students are able to use (create) graphs, tables and equations to represent (model) linear functions.

Student Speak:

- I can develop a table (A way of expressing domain & range in a row and column in a horizontal, vertical or T table format) from a linear graph (Pictorial representation of data or an equation).

- I can create a table (A way of expressing domain & range in a row and column in a horizontal, vertical or T table format) from a linear equation in any form including standard ($Ax + By = C$), point-slope ($y - y_o = m(x - x_o)$) and slope-intercept ($y = mx + b$).
- I can graph a linear equation in any form including general ($Ax + By = C$), point-slope ($y - y_o = m(x - x_o)$) and slope-intercept ($y = mx + b$).
- I can make a linear graph from a table (A way of expressing domain & range in a row and column in a horizontal, vertical or T table format).
- I can write the equation of a line in the form $f(x) = mx + b$ that passes through two points.
- Given any form of a linear equation, I can write it in the form $f(x) = mx + b$.

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