

# Algebra 1

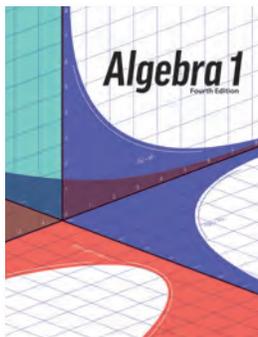
EDITION COMPARISON

NEW

## Updates

This edition reflects multiple significant changes from the previous edition. These revisions include multiple textual changes, newly integrated teaching strategies, condensed textbook chapters, updated visual elements, and updated student activities. The student edition page count has increased from 625 to 704. Course objectives have been refined, and biblical worldview shaping themes have been integrated into each chapter.

*Because of the extensive nature of these changes, this edition is not compatible with its predecessor.*



4th Edition



3rd Edition

## Content Updates

- Integrated four-step teaching cycle of engage, instruct, apply, and assess
- Reworded course objectives for specificity
- Added essential questions and simplified learning targets to each chapter section
- Added STEM lessons in the student activities book
- Added special sections on differentiated instruction
- Added on-page step-by-step solutions to the activities answer key
- Added key concept summaries and biblical worldview shaping objectives to each chapter review
- Added appendix lessons to address state standards regarding statistics
- Removed opening course review section and condensed the first three chapters into two
- Repurposed Dominion Modeling problems as Application Problems at the end of each chapter
- Updated guidelines for the current TI-84 Plus family of calculators
- Upgraded arithmetic sequence special feature to a full chapter section in Chapter 4
- Upgraded geometric sequence special feature to a full chapter section in Chapter 7
- Removed bulletin board ideas and select student activities

## Special Features

- Essential questions and simplified learning targets at the beginning of each section
- QR codes for access to instructional videos and practice problems
- Highlighted reviews for essential questions and key mathematical practices
- Skill checks for formative assessment
- Exercises grouped by degree of difficulty

## Textbook Snapshot

**4.6 DIRECT & INVERSE VARIATIONS**

**What is the significance of defining natural language related to direct and inverse variations?**

**After completing this section, I will be able to:**

- identify a function as direct, inverse, neither, or neither
- find the constant of variation for direct and inverse variations
- write equations modeling direct and inverse variations to solve word problems
- explain the significance of defining natural language related to direct and inverse variations

How much fuel does a constant rate of 22 liters, as indicated by each ordered pair listed in the table. This relationship can be expressed using the equation  $y = 22x$ . The distance traveled ( $y$ ) is a function of the amount of fuel ( $x$ ) for a given riding. Notice that the ratio  $\frac{y}{x} = 22$  for every ordered pair.

Fuel (liters)	Distance (miles)
1	22
2	44
3	66
4	88

**DEFINITION**

- A **direct variation** is a function in which the ratio of variables is a constant constant,  $k$ . That is,  $\frac{y}{x} = k$  or  $y = kx$ . The quantities are said to vary directly or to be **directly proportional**.
- The constant  $k$  is called the **constant of variation** or the constant of proportionality.

A direct variation can also be stated using the general equation  $y = kx + b$ , for  $b = 0$ . The graph's  $y$ -intercept is a constant multiple of the other. Most applications of direct variations involve a positive constant of proportionality ( $k > 0$ ), in which an increase in one of the variables causes an increase in the other variable.

**EXAMPLE 6: Determining a Direct Variation**

Does the table represent a direct variation? If so, find the constant of variation and write the function rule.

a. 

x	y
1	7
2	14
3	21
4	28

b. 

x	y
1	4
2	16
3	36
4	64

**Answers**

a. The table represents a direct variation since the ratio  $\frac{y}{x} = 7$  for each ordered pair. The constant of variation is 7 and the function rule is  $f(x) = 7x$ .

b. The table does not represent a direct variation since the ratio  $\frac{y}{x}$  is not a constant.

192 CHAPTER 4 Functions