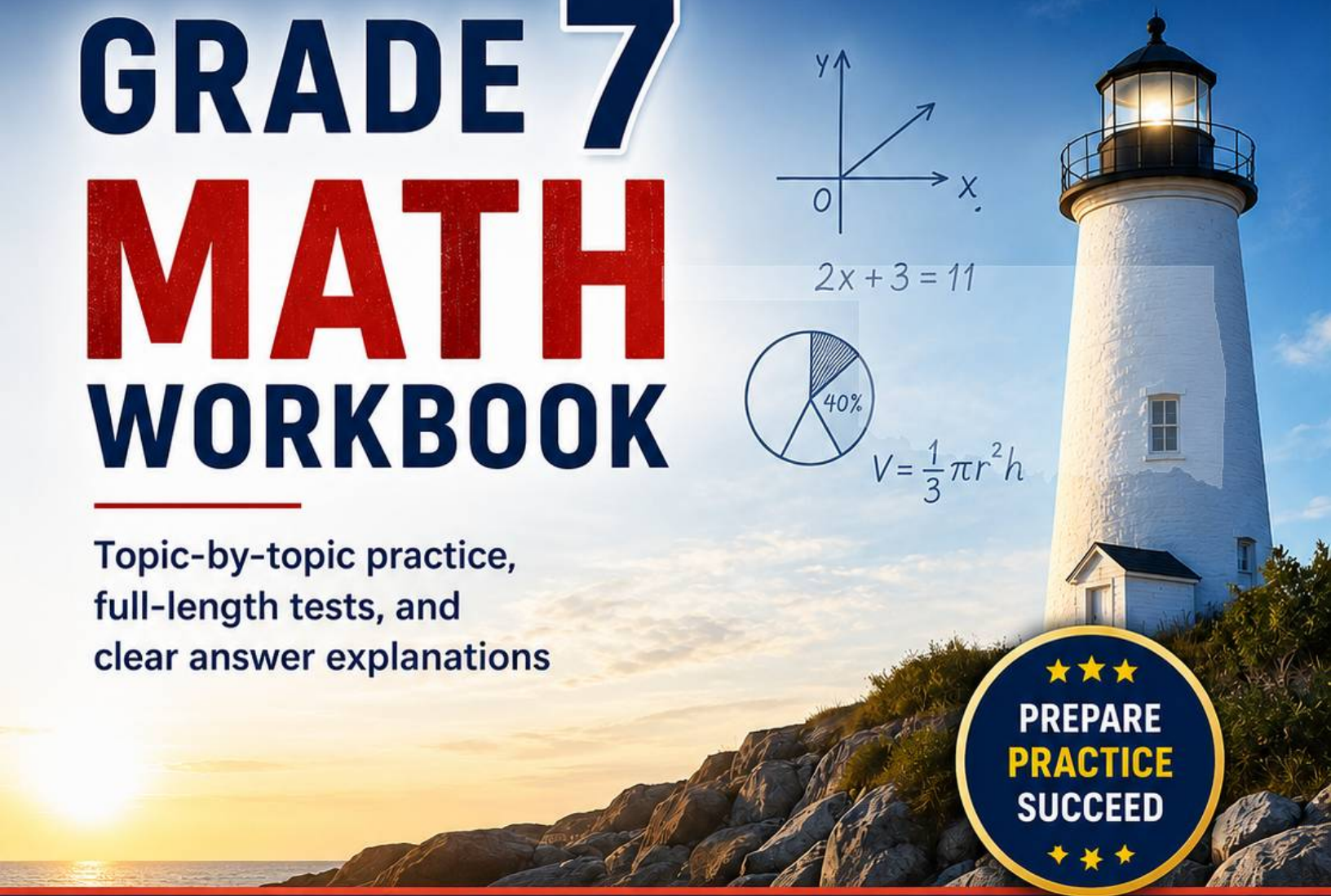
OKLAHOMA

OSTP

GRADE 7 MATH WORKBOOK



Topic-by-topic practice, full-length tests, and clear answer explanations

PREPARE PRACTICE SUCCEED

TOPIC-BY-TOPIC PRACTICE
Build skills and strengthen concepts

FULL-LENGTH TESTS
Realistic practice to build confidence

CLEAR ANSWER EXPLANATIONS
Understand every step and improve

Oklahoma School Testing Program

Oklahoma OSTP

Grade 7

Math Workbook

Topic-by-topic practice, full-length tests, and clear answer explanations

7

Built for steady Grade 7 progress

Integers, ratios, percents, expressions, geometry, statistics, and probability

75 Topic Worksheets

2 Full-Length Tests

Answer Explanations



Reza Nazari

Copyright ©

Effortless Math Education Inc

Published by Effortless Math Education

EffortlessMath.com

All rights reserved. No part of this publication may be reproduced, distributed, or transmitted in any form or by any means, including photocopying, recording, or other electronic or mechanical methods, without the prior written permission of the author, except in the case of brief quotations embodied in critical reviews and certain other noncommercial uses permitted by copyright law, including Section 107 or 108 of the 1976 United States Copyright Act.

This publication is independently produced and has no official connection to any state, district, or national testing program.

Test names and organizational names used herein are the property of their respective trademark holders.

7.GM.1.2	Using a variety of tools and strategies, develop the concept that surface area of a rectangular prism can be found by wrapping the figure with same-sized square units without gaps or overlap. Use appropriate measurements (e.g., cm2)
7.GM.1.3	Using a variety of tools and strategies, develop the concept that the volume of rectangular prisms can be found by counting the total number of same-sized unit cubes that fill a shape without gaps or overlaps. Use appropriate measurements (e.g., cm3)
7.GM.2	Use mathematical models and problems to calculate and justify the area of trapezoids and the area and perimeter of composite figures with rational measurements
7.GM.2.1	Develop and use the formula to determine the area of a trapezoid
7.GM.2.2	Find the area and perimeter of composite figures
7.GM.3	Use mathematical models and reasoning with proportions and ratios to determine measurements, justify formulas, and solve problems
7.GM.3.1	Solve problems that require the conversion of weights and capacities within the same measurement systems using appropriate units
7.GM.3.2	Demonstrate an understanding of the proportional relationship between the diameter and circumference of a circle and that the unit rate (constant of proportionality) is pi (π) and can be approximated by rational numbers such as22/7and 3.14
7.GM.3.3	Calculate the circumference and area of circles to solve problems in various contexts, in terms of pi (π) and using approximations for pi (π)
7.GM.4	Analyze the effect of translations, reflections, rotations, and dilations on the attributes of two-dimensional figures on and off the coordinate plane
7.GM.4.1	Describe the properties of similarity, compare geometric figures for similarity, and determine scale factors resulting from dilations
7.GM.4.2	Apply proportions, ratios, and scale factors to solve problems involving scale drawings and to determine side lengths and areas of similar triangles and rectangles
7.GM.4.3	Graph and describe translations (with directional and algebraic instructions), reflections across the x- and y-axes, and rotations in 90° increments about the origin of figures on a coordinate plane, and determine the coordinates of the vertices of a figure after a transformation



7.N | Oklahoma

Grade 7 expectations grouped under 7.N.

7.N.1	Read, write, represent, and compare rational numbers, expressed as integers, fractions, and decimals. Explain and apply the concept of absolute value
7.N.1.1	Compare and order rational numbers expressed in various forms using the symbols "<", ">", and "="
7.N.1.2	Recognize and generate equivalent representations of rational numbers, including equivalent fractions
7.N.1.3	Explain the relationship between the absolute value of a rational number and the distance of that number from zero on a number line. Use the symbol for absolute value. Apply the concept of absolute value to model and solve problems
7.N.2	Calculate with rational numbers, with and without positive integer exponents, to model and solve mathematical problems
7.N.2.1	Estimate solutions to multiplication and division of integers in order to assess the reasonableness of results
7.N.2.2	Illustrate multiplication and division of integers using a variety of representations
7.N.2.3	Multiply and divide integers in a variety of situations; use efficient and generalizable procedures, including standard algorithms
7.N.2.4	Raise rational numbers (integers, fractions, and decimals) to positive integer exponents
7.N.2.5	Model and solve problems using rational numbers involving addition, subtraction, multiplication, division, and positive integer exponents

Table of Contents

★ 1 Integers and Absolute Value 12

★ 2 Rational Numbers: Fractions and Decimals 32

★ 3 Rational Number Operations and Exponents 50

★ 4 Ratios, Rates, and Proportional Relationships 67

★ 5 Percents 91

★ 6 Expressions, Equations, and Inequalities 109

★ 7 Geometry — Angles and Triangles 137

★ 8 Geometry — Area and Perimeter 158

★ 9 Surface Area and Volume 180

★ 10 Statistics and Data Analysis 195

★ 11 Probability 219

★ 1 Practice Test 1 236

★ 2 Practice Test 2 252

★ Practice Test Answer Keys and Explanations 268

★ Topic Practice Answers and Explanations 273

Scan Me

Study Tips

- Among two negative integers, the one with the **smaller absolute value** is **greater**: $-3 > -10$ because $3 < 10$.
- Any positive integer is always greater than any negative integer: $1 > -1{,}000{,}000$.
- When ordering a mixed set, negatives always come before zero, and zero comes before all positives.

Word Problems

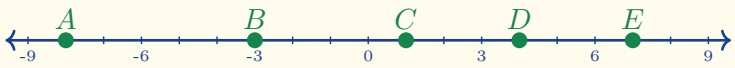
16. Five students competed in a math quiz bowl where correct answers earn points and incorrect answers lose points. Their final net scores were: -16, 8, -4, -21, and 5. Order the scores from *lowest to highest* and identify the student with the best score and the student with the worst score. Then find the range of scores (highest minus lowest).

_____

17. Four ocean animals are recorded at the following depths below the surface: a shark at -85 feet, a jellyfish at -12 feet, a sperm whale at -210 feet, and a yellowfin tuna at -47 feet. Order the animals from *shallowest* to *deepest* depth. How much deeper is the sperm whale than the shark?

_____

18. Five points are plotted on the number line shown here. Identify the integer at each point, then list the points in order from least to greatest. Which point has the greatest absolute value?



_____

1.4 Adding Integers 7.N.1

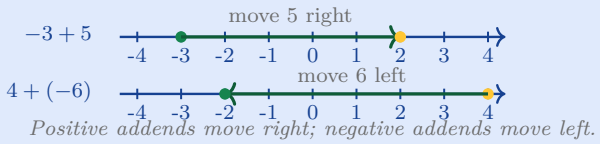
Think of adding integers as combining movements on a number line—or combining gains and losses in everyday life. Here is the key: when both numbers share the same sign, they move in the same direction, so you add the absolute values and keep that sign. When the signs are different, the numbers pull in opposite directions; you subtract the smaller absolute value from the larger one and keep the sign of whichever was stronger. You will also meet **zero pairs** (additive inverses), which show why a positive and its matching negative cancel out completely. Master these two rules and integer addition will feel natural every time.

Key Concepts & Quick Review

Same signs: Add the absolute values; keep the common sign. **Example:** $(-5)+(-8)=-(5+8)=-13$

Different signs: Subtract the smaller $|\cdot|$ from the larger; keep the sign of the larger $|\cdot|$.
Example: $(-9)+4=-(9-4)=-5$

Additive inverse: $a+(-a)=0$ **Identity:** $a+0=a$



Positive addends move right; negative addends move left.

Examples

① Evaluate $(-13)+7$.

Think It Through: The signs are different, so subtract the smaller absolute value from the larger one. That gives $13-7=6$. Now decide the sign by looking at which number has the larger absolute value. Since 13 is larger than 7, the negative number wins. So the sum is -6.

Answer: -6

② A hiker starts at 240 feet above sea level, descends 380 feet, then climbs back up 95 feet. What is the hiker's final elevation?

Think It Through: Translate the changes into integers: $240+(-380)+95$. First combine 240 and -380. Because the signs are different, subtract $380-240=140$ and keep

the sign of the larger absolute value, which is negative, so the result is -140. Then add 95: $-140 + 95 = -45$. The final elevation is -45 feet, which means 45 feet below sea level.

Answer: -45 *feet*

Practice Problems

Find each sum.

1. $5 + (-8) =$ _____

2. $(-6) + (-9) =$ _____

3. $(-12) + 7 =$ _____

4. $(-3) + 15 =$ _____

5. $(-14) + (-6) =$ _____

6. $8 + (-8) =$ _____

7. $(-25) + 13 =$ _____

8. $(-9) + (-11) =$ _____

9. $17 + (-24) =$ _____

10. $(-30) + 45 =$ _____

11. $(-7) + (-7) + 4 =$ _____

12. $12 + (-5) + (-9) =$ _____

13. $(-20) + (-15) + 30 =$ _____

14. $(-6) + 13 + (-4) =$ _____

15. $36 + (-49) =$ _____

Study Tips

- When adding a long list of integers, group positives together and negatives together first; then combine the two totals.
- Opposite integers cancel: $(-7) + 7 = 0$. Look for zero pairs to simplify quickly.
- The sign of the answer matches the sign of the integer with the **larger** absolute value.

Word Problems

16. During a single football drive, a team gains 14 yards on the first play, loses 19 yards on the second play, gains 8 yards on the third play, and loses 6 yards on the fourth play. Write an addition expression using integers to represent the total yardage change, and then find the result. Is the team ahead of or behind their starting position, and by how many yards?

_____

17. Kenji starts the week with \$15 in his account. He deposits \$30 on Monday, withdraws \$48 on Tuesday, deposits \$12 on Wednesday, and withdraws \$22 on Thursday. Write his balance after each transaction as an addition expression, and determine whether his

Scan Me