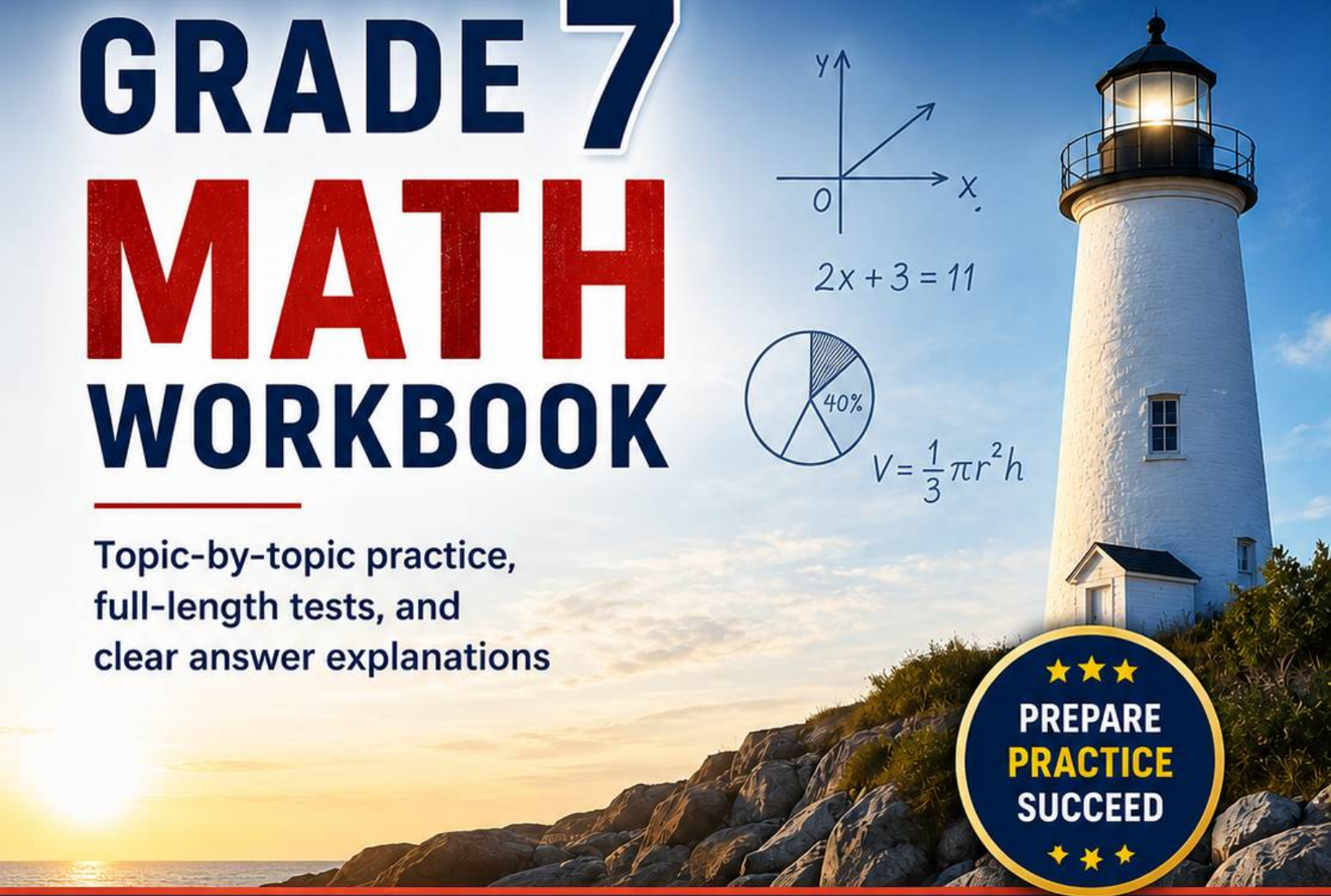
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AK STAR

GRADE 7 MATH WORKBOOK



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

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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

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2 Full-Length Tests

Answer Explanations



Reza Nazari

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7.SP.4	Use measures of center and measures of variability for numerical data from random samples to draw informal comparative inferences about two populations
7.SP.5	Understand that the probability of a chance event is a number between 0 and 1 that expresses the likelihood of the event occurring. Larger numbers indicate greater likelihood. A probability near 0 indicates an unlikely event, a probability around1/2indicates an event that is neither unlikely nor likely, and a probability near 1 indicates a likely event
7.SP.6	Approximate the probability of a chance event by collecting data on the chance process that produces it and observing its long-run relative frequency, and predict the approximate relative frequency given the probability
7.SP.7	Develop a probability model and use it to find probabilities of events. Compare probabilities from a model to observed frequencies; if the agreement is not good, explain possible sources of the discrepancy
7.SP.8	Find probabilities of compound events using organized lists, tables, tree diagrams, and simulation

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Table of Contents

★ 1 Integers and Absolute Value 11

★ 2 Rational Numbers: Fractions and Decimals 31

★ 3 Rational Number Operations and Exponents 49

★ 4 Ratios, Rates, and Proportional Relationships 63

★ 5 Percents 87

★ 6 Expressions, Equations, and Inequalities 105

★ 7 Geometry — Angles and Triangles 132

★ 8 Geometry — Area and Perimeter 160

★ 9 Surface Area and Volume 179

★ 10 Statistics and Data Analysis 198

★ 11 Probability 225

★ 1 Practice Test 1 252

★ 2 Practice Test 2 268

★ Practice Test Answer Keys and Explanations 284

★ Topic Practice Answers and Explanations 289

Scan Me

CHAPTER

1

Integers and Absolute Value

1. Understanding Integers and the Number Line — 7.NS.1
2. Absolute Value — 7.NS.1
3. Comparing and Ordering Integers — 7.NS.1
4. Adding Integers — 7.NS.1
5. Subtracting Integers — 7.NS.1
6. Multiplying Integers — 7.NS.2
7. Dividing Integers — 7.NS.2

1.4 Adding Integers

7.NS.1

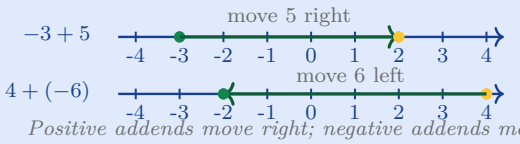
Think of adding integers as combining movements on a number line—or combining gains and losses in everyday life. Here is the key: when both numbers share the same sign, they move in the same direction, so you add the absolute values and keep that sign. When the signs are different, the numbers pull in 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

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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?

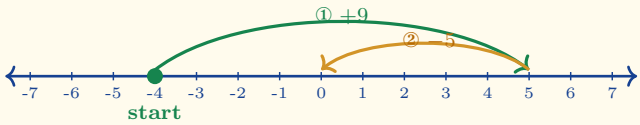
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17. Kenji starts the week with \$15 in his account. He deposits \$30 on Monday, withdraws \$48 on Tuesday, deposits \$12 on Wednesday, and withdraws \$22 on Thursday. Write his balance after each transaction as an addition expression, and determine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

account is positive or negative at the end of Thursday. If negative, how much does he owe?

_____

18. This number line shows two "jumps." The bug starts at -4, hops $+9$ along arrow ①, and then hops -5 along arrow ②. Write the addition expression for the bug's final position and find where the bug lands.



_____

1.5 Subtracting Integers

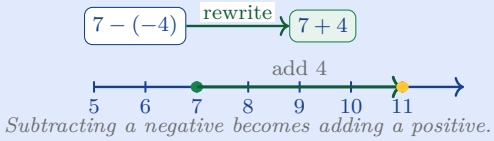
7.NS.1

Here is the secret to subtracting integers: don't treat it as something new! Every subtraction can be rewritten as **adding the opposite**: $a - b = a + (-b)$. After that one rewrite, you already know what to do—just use the integer-addition rules from the last section. Try it with $-6 - (-9)$: rewrite as $-6 + 9$, and the answer is 3. The more you practice this "add-the-opposite" move, the faster and more confident you will become with any integer subtraction problem.

Key Concepts & Quick Review

Subtraction Rule: $a - b = a + (-b)$ **Keep · Change · Change (KCC):** keep the first number, change subtraction to addition, change the sign of the second number.

Examples: $7 - (-4) = 7 + 4 = 11$ $\qquad (-5) - 9 = (-5) + (-9) = -14$
$(-3) - (-10) = (-3) + 10 = 7$



Subtracting a negative becomes adding a positive.

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