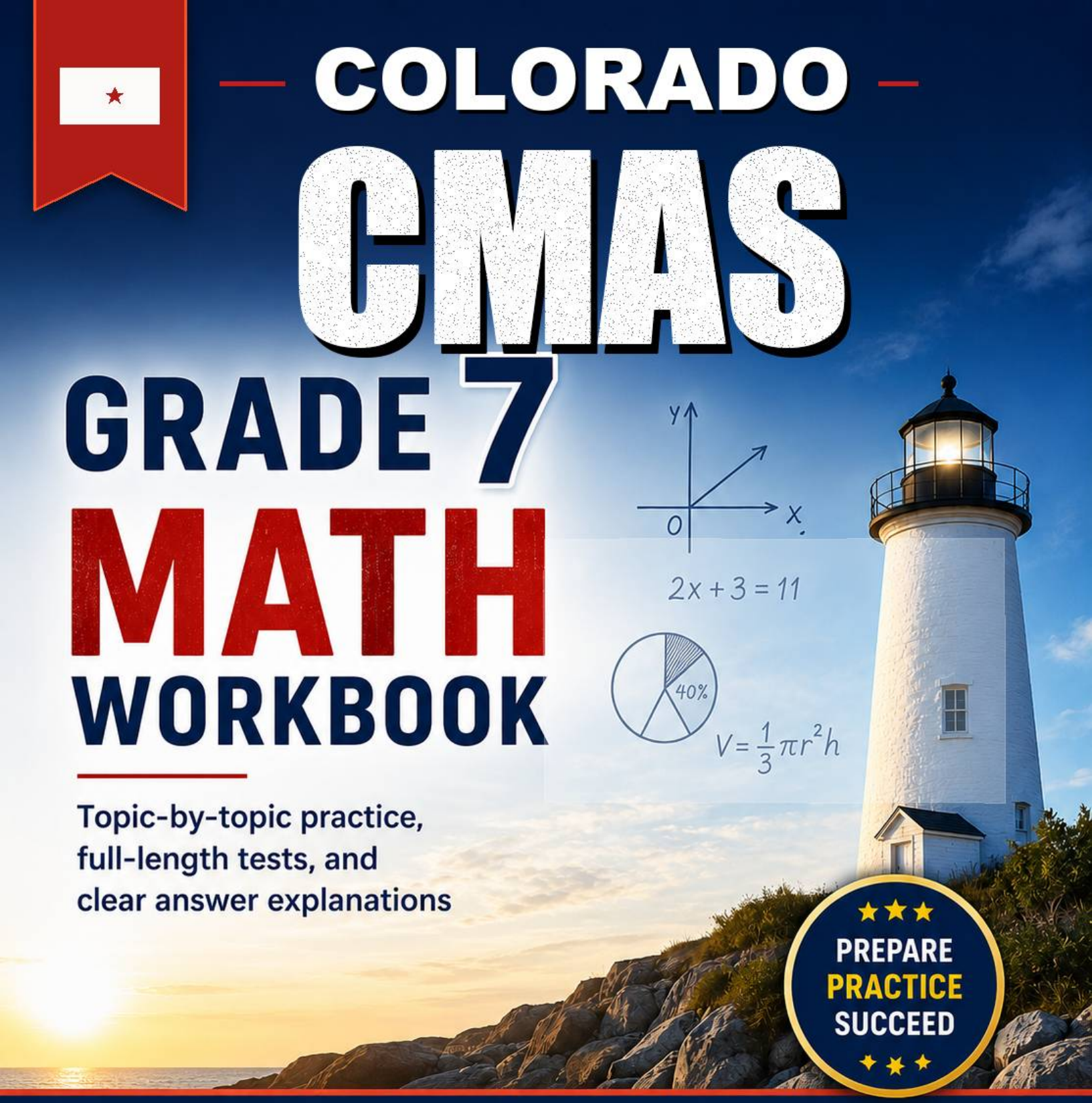
# COLORADO CMAS GRADE 7 MATH WORKBOOK




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

Colorado Measures of Academic Success

## Colorado CMAS

# 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

80 Topic Worksheets

2 Full-Length Tests

Answer Explanations




Reza Nazari

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*Grade 7 expectations grouped under 7.SP.*

| | |
|---|---|
| 7.SP.A | Statistics & Probability: Use random sampling to draw inferences about a population |
| 7.SP.A.1 | Understand that statistics can be used to gain information about a population by examining a sample of the population; explain that generalizations about a population from a sample are valid only if the sample is representative of that population. Explain that random sampling tends to produce representative samples and support valid inferences |
| 7.SP.A.2 | Use data from a random sample to draw inferences about a population with an unknown characteristic of interest. Generate multiple samples (or simulated samples) of the same size to gauge the variation in estimates or predictions |
| 7.SP.B | Statistics & Probability: Draw informal comparative inferences about two populations |
| 7.SP.B.3 | Informally assess the degree of visual overlap of two numerical data distributions with similar variabilities, measuring the difference between the centers by expressing it as a multiple of a measure of variability |
| 7.SP.B.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.C | Statistics & Probability: Investigate chance processes and develop, use, and evaluate probability models |
| 7.SP.C.5 | Explain 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 around 1/2 indicates an event that is neither unlikely nor likely, and a probability near 1 indicates a likely event |
| 7.SP.C.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 |



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7.SP.C.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.C.8 Find probabilities of compound events using organized lists, tables, tree diagrams, and simulation

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## 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

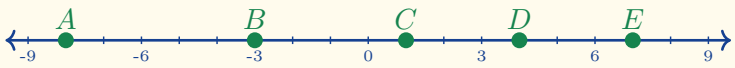
**16.** Five students competed in a math quiz bowl where correct answers earn points and incorrect answers lose points. Their final net scores were: $-16$, $8$, $-4$, $-21$, and $5$. Order the scores from *lowest to highest* and identify the student with the best score and the student with the worst 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.NS.A.1

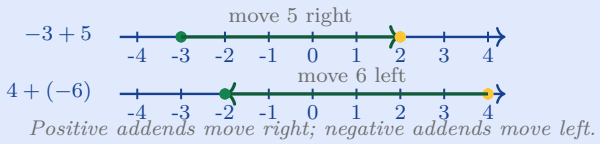
Think of adding integers as combining movements on a number line—or combining gains and losses in everyday life. Here is the key: when both numbers share the same sign, they move in the same direction, so you add the absolute values and keep that sign. When the signs are different, the numbers pull in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



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