

6 Tennessee TCAP

GRADE 8 MATH PRACTICE TESTS

Standards Aligned Problem Solving For
Comprehensive Assessment Programs



6 PRINTED
TESTS



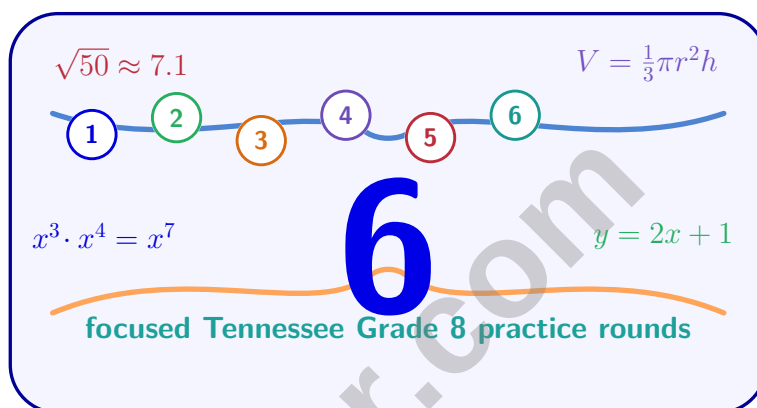
2 ONLINE
TESTS



Use these two additional online practice tests for extra review after the printed tests in this book.

6 Tennessee TCAP Grade 8 Math Practice Tests

Grade 8 Math Practice with State-Aligned Skills and Full Explanations



Six complete 40-question Grade 8 TCAP practice rounds with real numbers, exponents, scientific notation, equations, functions, transformations, geometry, data analysis, probability, answer keys, and clear explanations for every item.

Jay Daie and Reza Nazari



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Welcome, Tennessee Grade 8 Problem Solver!

Six focused rounds for sharper TCAP math thinking

This book gives you six full Grade 8 TCAP math practice tests. Each round is built to help you recognize structure, reason with real numbers and exponents, analyze linear relationships, connect equations with graphs, and explain your thinking with care.

Your Tennessee Practice Promise

I will read every question carefully, choose a strategy that fits, write enough work to prove my answer, and use corrections as training for the next test.

Read

Model

Verify

How to Use This Book

A six-session plan for confident Grade 8 review

1. **Warm up with the review pages.** Notice the big ideas before starting the tests.
2. **Complete one test at a time.** Treat each 40-question round like a real practice session.
3. **Show your reasoning.** Jot an exponent rule, equation, graph, transformation, diagram, or quick estimate when it helps.
4. **Correct actively.** Rework missed items before reading the explanation.
5. **Choose the next target.** After each test, name one skill and one habit to improve.

Tennessee review rhythm: Work a test, score it, study your misses, then come back ready for the next round with one clear goal.



What Is Inside?

Six TCAP tests, 240 questions, and a complete review path

Part	What You Will Practice
Tests 1–3	Real numbers, exponents, scientific notation, equations, and careful reading.
Tests 4–6	Functions, systems, transformations, geometry, data analysis, and multi-step problem solving.
Answer Pages	Compact keys and explanations that show why each answer works.

The tests are mixed on purpose. Grade 8 success means recognizing which idea is being tested even when the next question changes format.

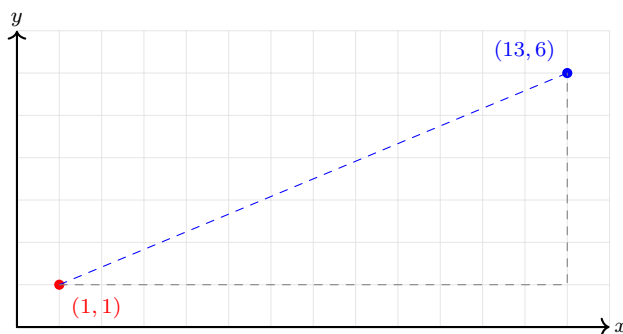


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1) What is the distance between $(1, 1)$ and $(13, 6)$?



- ☐ A. 7
- ☐ B. 17
- ☐ C. 13
- ☐ D. $\sqrt{119}$
- 2) If a is rational and b is irrational, which must be true?
- ☐ A. $a + b$ is rational
- ☐ B. $a \times b$ is rational
- ☐ C. $b - a$ is rational
- ☐ D. $a + b$ is irrational
- 3) A credit card has a balance of \$800 with 18% APR. Which list correctly shows the interest charged each month (assuming no payments)?
- ☐ A. \$12, \$12, \$12, ...
- ☐ B. \$18, \$18, \$18, ...
- ☐ C. \$12, \$24, \$36, ...
- ☐ D. \$12, \$12.18, \$12.36, ...
- 4) Which number is the largest?
- ☐ A. 3.1×10^{-2}
- ☐ B. 3.1×10^{-1}
- ☐ C. 3.1×10^0
- ☐ D. 3.1×10^1



5) Is $\sqrt{17}$ closer to 4 or closer to 5?

☐ A. Both equally close

☐ B. Closer to 5

☐ C. Closer to 4

☐ D. Cannot determine

6) Simplify $\left(\frac{x}{y}\right)^2$ where $y \neq 0$.

☐ A. $\frac{2x}{2y}$

☐ B. $\frac{x}{y^2}$

☐ C. $\frac{x^2}{y^2}$

☐ D. $\frac{x^2}{y}$

7) A square field has an area of 256 square meters. What is its perimeter?

☐ A. 32 meters

☐ B. 48 meters

☐ C. 64 meters

☐ D. 96 meters

8) A residual plot has residuals 1, -2, 1, 2, -1, 0. What is the greatest absolute residual?

9) $\frac{(4 \times 10^6) \times (3 \times 10^2)}{6 \times 10^4} = ?$

☐ A. 2×10^2

☐ B. 12×10^8

☐ C. 2×10^4

☐ D. 0.2×10^4



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10) A student solved a system and got $x = 4, y = -2$. Which system did the student solve?

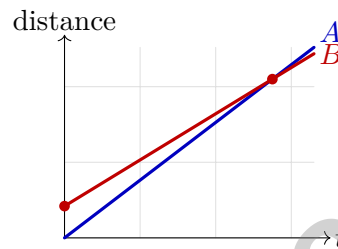
☐ A. $2x + y = 6$ and $x - y = 5$

☐ C. $y = -x + 1$ and $y = 2x - 10$

☐ B. $3x - y = 14$ and $x + y = 2$

☐ D. $x - 2y = 7$ and $2x + y = 6$

11) Function $A(t) = 60t$ (mph). Function B passes through $(0, 1)$ and $(5, 5)$ (on distance-time graph, with t in hours). Which travels faster?



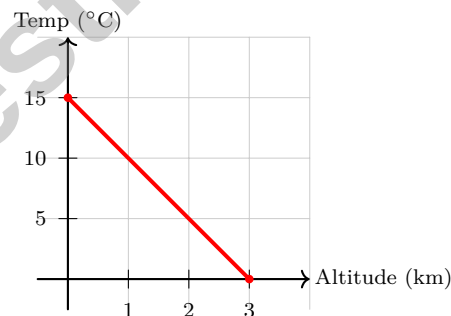
☐ A. Function A

☐ C. Both same speed.

☐ B. Function B

☐ D. Cannot be determined.

12) A graph shows temperature (in $^{\circ}\text{C}$) versus altitude (in km). The line passes through $(0, 15)$ and $(3, 0)$.



What is the slope?

☐ A. -5°C per km

☐ C. $-\frac{1}{5}^{\circ}\text{C}$ per km

☐ B. 5°C per km

☐ D. 3°C per km



1) Which function is NOT proportional (i.e., does not pass through the origin)?

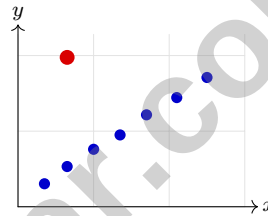
☐ A. $y = 3x$

☐ C. $y = 2x + 1$

☐ B. $y = 5x$

☐ D. $y = \frac{1}{2}x$

2) A student dilates a triangle with scale factor 2 and claims the new triangle's perimeter is twice the original. Is this correct?

☐ A. No, the perimeter is multiplied by 4☐ C. No, the area is multiplied by 2☐ B. Yes, linear measurements scale by 2☐ D. Only if the triangle is equilateral

3)

In a scatter plot, an **outlier** is best defined as:

☐ A. A data point that lies far from the general pattern or trend of the data☐ C. The point with the largest x-value☐ B. Any point that does not fall exactly on a perfect line☐ D. The point with the smallest y-value

4) Data from 280 households shows: 168 have broadband internet, 112 do not. Among those with broadband, 126 subscribed to streaming services. What is the relative frequency of streaming subscribers among broadband users?

☐ A. 0.45

☐ C. 0.75

☐ B. 0.67

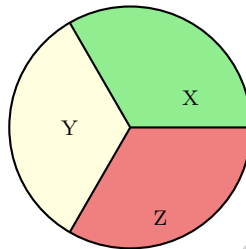
☐ D. 0.85



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- 5) A sports analyst compares two players' scoring consistency. Player A averaged 15 points with $MAD = 1.5$. Player B averaged 15 points with $MAD = 4$. Who is the more reliable scorer?

- ☐ A. Player A (more consistent) ☐ C. They are equally reliable
☐ B. Player B (higher variability makes them adaptable) ☐ D. Cannot determine from MAD alone



6)

The spinner has three sections: X covers 120° , Y covers 120° , Z covers 120° . What is the probability of NOT landing on Y?

- ☐ A. $\frac{1}{2}$ ☐ C. $\frac{1}{3}$
☐ B. $\frac{2}{3}$ ☐ D. $\frac{1}{6}$
- 7) An event coordinator needs to select a chairperson from 4 candidates, a secretary from 5 candidates, and a treasurer from 3 candidates. How many different leadership teams can be formed?

- ☐ A. $4 + 5 + 3 = 12$ ☐ C. $5^{4+3} = 5^7$
☐ B. $4 \times 5 \times 3 = 60$ ☐ D. $(4 + 5) \times 3 = 27$



- 1) In a two-way table of 500 voters by income and voting choice:

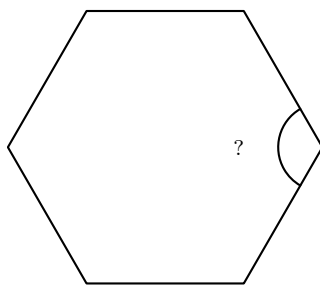
	Yes	No	Total
High Income	150	100	250
Low Income	120	130	250
Total	270	230	500

A student claims: “Since both income groups total 250, there is no association.” Is this reasoning correct?

- ☐ A. Yes; equal row totals guarantee independence.
 ☐ C. Yes; balancing the sample sizes shows no bias.
- ☐ B. No; equal row totals don't ensure equal conditional frequencies.
 ☐ D. No; we must check the yes vote totals, which differ.
- 2) A car's fuel consumption shows: rapid decrease at first, then slowing. Which behavior does this match?
- ☐ A. Draining a pool with a pump
 ☐ C. Linear fuel burn
- ☐ B. Radioactive decay (initial sharp drop, then levels off)
 ☐ D. Exponential growth
- 3) A right triangle has legs of 15 and 20. How much longer is the hypotenuse than the shorter leg?
- ☐ A. 10
 ☐ C. 25
- ☐ B. 20
 ☐ D. 35



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4)

A regular hexagon is shown with one interior angle marked. What is the measure of the marked interior angle?

☐ A. 100° ☐ C. 120° ☐ B. 110° ☐ D. 130°

5) Rectangle X is similar to Rectangle Y . Rectangle X has perimeter 20 m. Rectangle Y has perimeter 50 m. What is the ratio of the side lengths (X to Y)?

☐ A. $2 : 5$ ☐ C. $5 : 2$ ☐ B. $4 : 25$ ☐ D. $25 : 4$

6) Factor $x^2 - 14x + 45$.

$$x^2 - 14x + 45$$

Multiply: 45

Add: -14

☐ A. $(x - 5)(x - 9)$ ☐ C. $(x - 10)(x - 4)$ ☐ B. $(x - 15)(x + 1)$ ☐ D. $(x - 45)(x + 1)$ 

Tennessee TCAP Grade 8 Practice Test Answer Keys**How to use this section with a Grade 8 student:**

1. check the answer first and circle any item that needs another look
2. retry the problem with fresh work before reading the explanation
3. write one short lesson learned from each missed or guessed item

A strong review routine turns every correction into a sharper plan for the next Tennessee TCAP practice test.



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Practice Test Answers and Explanations

Practice Test 1 Answers and Explanations

- 1) **Choice C is correct.** (8.G.B.5) $d = \sqrt{(13-1)^2 + (6-1)^2} = \sqrt{12^2 + 5^2} = \sqrt{144 + 25} = \sqrt{169} = 13$. (This is a 5-12-13 Pythagorean triple.)
- 2) **Choice D is correct.** (8.NS.A.1) The sum of a rational and an irrational number is always irrational. For example, $2 + \sqrt{3}$ is irrational. Similarly, $b - a$ is irrational, but products can vary.
- 3) **Choice D is correct.** (8.G.B.4) Monthly rate: $18\%/12 = 1.5\%$. Month 1: $800 \times 0.015 = \$12$. Month 2: $812 \times 0.015 = \$12.18$. Month 3 uses the new balance, about \$824.18, so the interest is $824.18 \times 0.015 \approx \12.36 .
- 4) **Choice D is correct.** (8.EE.A.3) The most positive exponent gives the largest value. $3.1 \times 10^1 = 31$ is the largest.
- 5) **Choice C is correct.** (8.NS.A.2) The midpoint between 4 and 5 is 4.5. Check: $(4.5)^2 = 20.25$. Since $17 < 20.25$, we have $\sqrt{17} < 4.5$. Therefore $\sqrt{17}$ is closer to 4.
- 6) **Choice C is correct.** (8.EE.A.1) Apply power to numerator and denominator: $\left(\frac{x}{y}\right)^2 = \frac{x^2}{y^2}$.
- 7) **Choice C is correct.** (8.EE.A.2) Area = 256, so $s = \sqrt{256} = 16$ m. Perimeter = $4s = 4 \times 16 = 64$ m.
- 8) **The correct answer is 2.** (8.SP.A.2) The largest absolute value among the residuals is 2.
- 9) **Choice C is correct.** (8.EE.A.4) Numerator: $(4 \times 3) \times 10^{6+2} = 12 \times 10^8$. Then divide: $\frac{12 \times 10^8}{6 \times 10^4} = 2 \times 10^4$.
- 10) **Choice B is correct.** (8.EE.C.8) Verify (4, -2) in option B: $3(4) - (-2) = 14$ and $4 + (-2) = 2$. The other choices do not satisfy both equations.
- 11) **Choice A is correct.** (8.F.A.2) Speed is the slope. A has slope 60 mph. B has slope $(5-1)/(5-0) = 4/5 = 0.8$ mph. Since $60 > 0.8$, A travels faster.
- 12) **Choice A is correct.** (8.EE.B.5) Slope = $\frac{0-15}{3-0} = \frac{-15}{3} = -5^\circ\text{C}$ per km. Temperature decreases 5 degrees for every 1 km increase in altitude.
- 13) **Choice C is correct.** (8.G.C) Let n = nickels, d = dimes. Then $n + d = 25$ and $0.05n + 0.10d = 1.70$. From the first equation, $d = 25 - n$. Substituting: $0.05n + 0.10(25 - n) = 1.70$, so $0.05n + 2.5 - 0.10n = 1.70$, giving $-0.05n = -0.8$, so $n = 12$.
- 14) **The correct answer is $\frac{1}{7}$.** (8.SP.B.4) Total: 15 tokens. $P(\text{black first}) = \frac{6}{15}$; $P(\text{black second} \mid \text{black first}) = \frac{5}{14}$. Product: $\frac{6}{15} \times \frac{5}{14} = \frac{1}{7}$.
- 15) **Choice C is correct.** (8.F.A.1) In function notation $f(20)$, the input is $t = 20$ minutes and the output is the distance. So $f(20)$ means the distance from home after 20 minutes of driving.
- 16) **Choice D is correct.** (8.G.C.6) A triangular pyramid has 4 triangular faces (one base, three lateral). If each has area 10 cm^2 , total surface area = $4 \times 10 = 40 \text{ cm}^2$.
- 17) **Choice C is correct.** (8.G.A.1) A 180° rotation maps $(x, y) \rightarrow (-x, -y)$, placing the image on the opposite side of the origin. Single reflections across axes do not have this property.
- 18) **The correct answer is 24.** (8.SP.B.4) Calculate the factorial: $4! = 4 \times 3 \times 2 \times 1 = 24$ different arrangements.
- 19) **Choice D is correct.** (8.EE.B.6) Using $y = mx + b$ where m is slope and b is y -intercept: $y = 4x + 6$.
- 20) **Choice A is correct.** (8.EE.C.7) Distribute: $2t + 6 = t + 10$. Subtract t and 6: $t = 4$.
- 21) **The correct answer is A,C.** (8.G.A.1) Correct: (A) Corresponding angles are congruent — definition of similarity. (C) Corresponding sides are proportional — they scale by a constant factor k . Incorrect: (B) Equal length is congruence, not similarity. (D) Congruence requires equality; similarity allows scaling. (E) Scale factor can be any positive number; $k < 1$ is a reduction, still similarity.
- 22) **Choice C is correct.** (8.EE.C.9) Set up: $12h + 50 \geq 170$. Subtract 50: $12h \geq 120$. Divide by 12: $h \geq 10$ hours.
- 23) **Choice A is correct.** (8.EE.C.9) At most \$300 means the budget is less than or equal to 300. The solid boundary line includes the exact limit of \$300.
- 24) **Choice C is correct.** (8.G.C.6) $V = \frac{4}{3}\pi r^3 = \frac{4}{3} \times 3.14 \times 729 = 3052.08 \text{ ft}^3$.
- 25) **Choice A is correct.** (8.SP.A.3) The slope (0.25) represents the rate of change: for every 1 GB used, cost increases by \$0.25.



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Hi, Momentum Builder!

◇ Finishing a Grade 8 practice book is not a small thing. It means you practiced persistence, patience, and flexible problem solving. ◇

★ **Remember this:** Some questions were quick. Others probably made you stop and think. Both kinds helped you grow because practice turns effort into confidence. This version gave you 6 opportunities to rehearse test-day habits. ★

Momentum Habits

- **Start Clean:** Write down what the problem gives you.
- **Pick a Tool:** Use a table, model, equation, or graph.
- **Keep Moving:** Skip and return when needed.
- **Review Smart:** Study mistakes without judging yourself.

Grade 8 test-day tip: If a problem feels stuck, change tools. A graph, table, or sketch can make the same idea clearer.

If you want to share something or ask a question, please email me at jay@testinar.com.

Jay Daie

Your Math Momentum Partner

PRACTICE TODAY. ACHIEVE TOMORROW.

6

Give your child the confidence and skills they need with **6 full-length Grade 8 Math** practice tests that reflect real test formats and cover all key math standards. Perfect for building skills, strengthening problem-solving abilities, and achieving success on test day!

WHAT'S INSIDE?



Standards-Aligned Practice

Questions designed to cover essential Grade 8 math standards.



Variety of Question Types

Multiple-choice, short answer, and more to build well-rounded skills.



Real-World Applications

Engaging problems that connect math to everyday life.



Step-by-Step Progress

Track improvement and build confidence with every test.



COVERS ALL ESSENTIAL TOPICS

- | | |
|---------------------------------------|----------------------------|
| ✓ The Number System | ✓ Statistics & Probability |
| ✓ Expressions & Equations | ✓ Pythagorean Theorem |
| ✓ Ratios & Proportional Relationships | ✓ Volume & Surface Area |
| ✓ Linear Equations | ✓ Transformations |
| ✓ Functions | ✓ Inequalities |
| ✓ Geometry | ✓ Data Analysis & Graphing |
| | ✓ And More! |



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