

TENNESSEE TCAP

GRADE 8 MATH

PRACTICE TESTS

5

PRINTED
TESTS



2

 ONLINE
TESTS

**Standards Aligned
Problem Solving For
Comprehensive Assessment Programs**



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

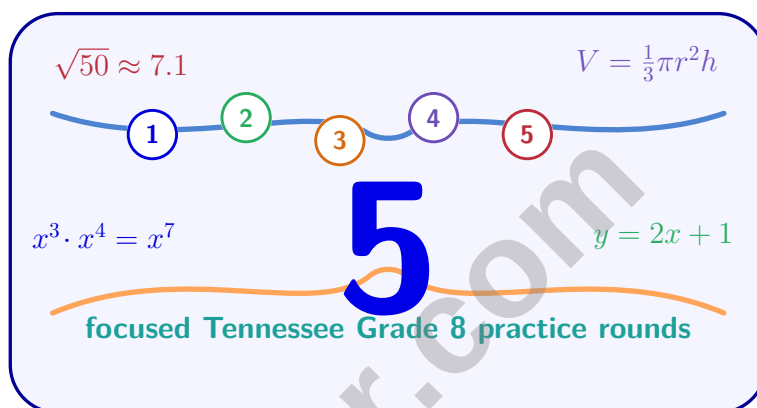


$$a^2 + b^2 = c^2$$



5 Tennessee TCAP Grade 8 Math Practice Tests

Five TCAP Tests for Models, Transformations, and Probability



Five 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!

Five focused rounds for sharper TCAP math thinking

This book gives you five 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 five-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?

Five TCAP tests, 200 questions, and a focused review path

Part	What You Will Practice
Tests 1–2	Real numbers, exponents, scientific notation, equations, and careful reading.
Tests 3–5	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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& answers

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- 1) A person compares two loans for \$2,000:

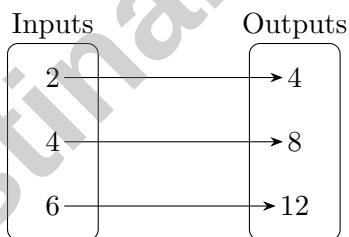
Loan	APR	Term
X	5%	2 years
Y	4%	3 years

If the person wants to minimize total borrowing cost, which loan is better?

- ☐ A. Need more information ☐ C. They cost the same
☐ B. Loan Y ☐ D. Loan X

- 2) Evaluate $(x + 4)(x + 8)$ when $x = 1$.

- 3) In the mapping diagram with inputs 2, 4, and 6, how many inputs are in the domain?



4) Function u passes through $(0, -1)$ and $(2, 3)$. Function $v(x) = -x + 5$. Which has a positive slope?

☐ A. Only u

☐ C. Both u and v

☐ B. Only v

☐ D. Neither u nor v

5) Which expression is equivalent to $3^2 \cdot 3^5$?

☐ A. 3^{10}

☐ C. 3^7

☐ B. 9^7

☐ D. 3^3

6) A plant grows at a constant rate. After 2 weeks it is 8 inches tall. After 6 weeks it is 14 inches tall. What is the rate of growth per week (slope)?

☐ A. 1.5 inches per week

☐ C. 2 inches per week

☐ B. 3.5 inches per week

☐ D. 7 inches per week

7) A chemist mixes a 30% acid solution with an 80% acid solution to make 100 mL of a 50% solution. Let x = volume of 30% solution (mL). Which equation represents the acid content?

☐ A. $0.3x + 0.8(100 - x) = 0.5(100)$

☐ C. $30x + 80x = 50 \cdot 100$

☐ B. $0.3(100 - x) + 0.8x = 50$

☐ D. $0.3x + 0.8x = 50$

8) The table shows a linear function $m(x)$:

x	0	2	4	6
$m(x)$	5	11	?	23

What is $m(4)$?

☐ A. 15

☐ C. 17

☐ B. 16

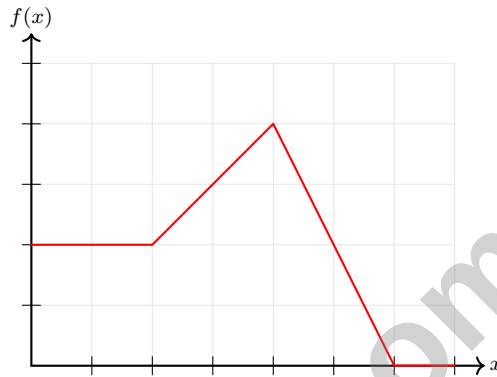
☐ D. 18



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- 9) An electrician charges \$50 for a service call and \$35 per hour. A customer's bill comes to \$225. How many hours did the electrician work?

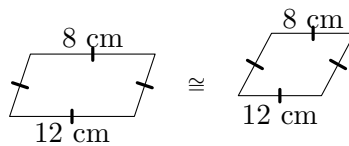
- ☐ A. 4 hours ☐ C. 6 hours
☐ B. 5 hours ☐ D. 7 hours



10)

Identify the intervals where the function is increasing.

- ☐ A. From $x = 1$ to $x = 3$ only ☐ C. From $x = 1$ to $x = 3$ and from $x = 3$ to $x = 5$
☐ B. From $x = -1$ to $x = 1$ ☐ D. From $x = -1$ to $x = 3$
- 11) Two congruent trapezoids are shown. One trapezoid has parallel sides of 8 cm and 12 cm. What are the parallel sides of the congruent trapezoid?



- ☐ A. 4 cm and 6 cm ☐ C. 16 cm and 24 cm
☐ B. 8 cm and 12 cm ☐ D. Cannot be determined



1) Simplify $\frac{20x^9}{5x^3}$.

☐ A. x^6

☐ C. $15x^6$

☐ B. $4x^{12}$

☐ D. $4x^6$

2) A side job pays a bonus of \$800, invested at 5% simple interest. How long until the account grows to \$880?

☐ A. 1 year

☐ C. 3 years

☐ B. 4 years

☐ D. 2 years

3) Real-world extrapolation: Email subscribers grow as $S(d) = 150 + 40d$ per day. Competitor at day 5 has 500 subscribers, day 10 has 700. Which will have more subscribers at day 15?

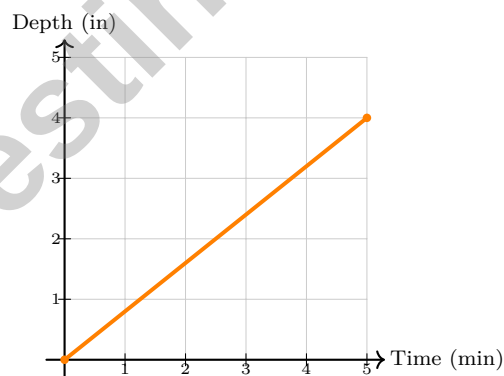
☐ A. First email service

☐ C. Both equal

☐ B. Competitor

☐ D. Cannot determine

4) A graph shows depth of water versus time as a pool is filled.



What is the filling rate (slope)?

☐ A. $\frac{4}{5}$ inches per minute

☐ C. 4 inches per minute

☐ B. $\frac{5}{4}$ inches per minute

☐ D. 5 inches per minute



- 5) A car traveling at 60 mph leaves 1 hour before a car traveling at 75 mph. How long does the faster car take to catch the slower car?
- ☐ A. 2 hours ☐ C. 4 hours
☐ B. 3 hours ☐ D. 5 hours
- 6) If $f(x) = \frac{2x+5}{3}$, what is $f(4)$?
- ☐ A. 3 ☐ C. $\frac{26}{3}$
☐ B. 4 ☐ D. $\frac{13}{3}$
- 7) Factor completely: $6x^2 + 12x + 6$.
- ☐ A. $6(x^2 + 2x + 1)$ ☐ C. $2(3x^2 + 6x + 3)$
☐ B. $6(x + 1)^2$ ☐ D. $3(2x + 2)^2$
- 8) A parking meter charges \$0.50 per hour. The relation between hours h and cost c is (h, c) . Is this relation a function?
- ☐ A. No, because cost increases with time. ☐ C. No, because the cost depends on the time.
☐ B. Yes, each hour value gives exactly one cost value. ☐ D. Yes, only if the meter is working correctly.
- 9) The first differences of a sequence are $-2, -2, -2, -2$. This indicates a:
- ☐ A. Nonlinear function ☐ C. Exponential function
☐ B. Quadratic function ☐ D. Linear function with negative slope



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1) A river flows at 3 mph. A boat travels 4 hours downstream and 6 hours upstream for the same distance. What is the boat's speed in still water?

☐ A. 10 mph

☐ C. 15 mph

☐ B. 12 mph

☐ D. 18 mph

2) A gift of \$2,000 is offered in two ways: receive \$200 cash now or invest it at 8% simple interest for 1 year. Which choice results in more money after 1 year?

☐ A. Cannot determine without more information

☐ C. Both result in the same amount

☐ B. Invest at 8% for 1 year; total will be \$2,160

☐ D. Receive \$200 cash now; total will be \$2,200

3) What is $(-2)^4$?

☐ A. -16

☐ C. -8

☐ B. 8

☐ D. 16

4) What is $\sqrt{400}$?

☐ A. 18

☐ C. 20

☐ B. 19

☐ D. 21

5) A student multiplies $(3.5 \times 10^4) \times (2 \times 10^3)$ and gets 7×10^7 . Which is true?

☐ A. The exponents should be multiplied to get 10^{12} .

☐ C. The student is correct.

☐ B. The coefficient is wrong; should multiply as $3.5 \times 2 = 7$, not separate.

☐ D. The coefficient should be changed to 0.7.



6) Solve by elimination:
$$\begin{cases} 2x + 5y = 19 \\ 2x + y = 7 \end{cases}$$

☐ A. (1, 5)

☐ C. (3, 1)

☐ B. (2, 3)

☐ D. (4, -1)

7) Video streaming Plan A: \$2.99 base, \$0.50 per movie. Plan B through (0, 1) and (10, 6) on a cost-movie plane. Which plan costs more at 20 movies?

☐ A. Plan A

☐ C. Both equal

☐ B. Plan B

☐ D. Cannot be determined

8) A store notices that for every 2 customers who enter, 1 item is sold. What is the slope of items sold versus customers?

☐ A. 2

☐ C. 3

☐ B. $-\frac{1}{2}$

☐ D. $\frac{1}{2}$

9) If $f(x) = |x - 2|$, what is $f(5)$?

☐ A. 3

☐ C. 7

☐ B. -3

☐ D. -7

10) Under a reflection across the line $y = x$, the point (4, 7) maps to which point?

☐ A. (7, 4)

☐ C. (4, -7)

☐ B. (-4, -7)

☐ D. (-7, -4)



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& answers

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 D is correct.** (8.G.B.4) Loan X costs \$200 in interest; Loan Y costs \$240. Loan X is cheaper overall.
- 2) **The correct answer is 45.** (8.EE.C.9) Substitute $x = 1$: $(1 + 4)(1 + 8) = 5 \cdot 9 = 45$.
- 3) **The correct answer is 3.** (8.F.A.1) The domain contains the three inputs 2, 4, and 6.
- 4) **Choice A is correct.** (8.F.A.2) Slope of u : $(3 - (-1))/(2 - 0) = 4/2 = 2 > 0$. Slope of v : $-1 < 0$. Only u is positive.
- 5) **Choice C is correct.** (8.EE.A.1) When multiplying powers with the same base, add exponents: $3^2 \cdot 3^5 = 3^{2+5} = 3^7$.
- 6) **Choice A is correct.** (8.EE.B.5) Using (2, 8) and (6, 14): slope $= \frac{14 - 8}{6 - 2} = \frac{6}{4} = 1.5$ inches per week.
- 7) **Choice A is correct.** (8.G.C) The 30% solution contributes $0.3x$ mL of pure acid. The 80% solution contributes $0.8(100 - x)$ mL. Total pure acid must equal $0.5(100) = 50$ mL. Only option A is correct.
- 8) **Choice C is correct.** (8.F.A.1) The pattern shows the function increases by 3 for each unit increase in x (or by 6 for each 2-unit increase). So $m(4) = 11 + 6 = 17$.
- 9) **Choice B is correct.** (8.F.B.4) Equation: $C = 35h + 50$. Set $C = 225$: $225 = 35h + 50 \Rightarrow 175 = 35h \Rightarrow h = 5$ hours.
- 10) **Choice A is correct.** (8.F.B.5) From $x = -1$ to $x = 1$: the function is constant at $f(x) = 2$ (neither increasing nor decreasing). From $x = 1$ to $x = 3$: the function increases from 2 to 4. From $x = 3$ onward: the function decreases.
- 11) **Choice B is correct.** (8.G.A.2) Congruent figures have equal corresponding sides. The congruent trapezoid has the same parallel sides: 8 cm and 12 cm.
- 12) **Choice A is correct.** (8.G.A.1) Reverse the translation: $(x, y) \rightarrow (x + 6, y - 4)$. So $P = (1 + 6, 8 - 4) = (7, 4)$.
- 13) **Choice D is correct.** (8.G.A.2) Use the triangle angle sum: $50 + 30 + \angle ACB = 180$. So $\angle ACB = 180 - 50 - 30 = 100^\circ$.
- 14) **Choice A is correct.** (8.G.B.3, 8.G.B.4) Pythagorean Theorem: $a^2 + b^2 = c^2$, so $6^2 + 8^2 = c^2$, $36 + 64 = 100$, $c = \sqrt{100} = 10$.
- 15) **Choice A is correct.** (8.G.B.5) By the Pythagorean Theorem, $c^2 = 6^2 + 8^2 = 36 + 64 = 100$. Taking the square root: $c = \sqrt{100} = 10$.
- 16) **Choice B is correct.** (8.G.B.4) Corresponding angles are congruent when a transversal cuts parallel lines. So $v = 68^\circ$.
- 17) **The correct answer is 2.** (8.F.A.3) The change in y is 4 when x increases by 2, so the slope is $4 \div 2 = 2$.
- 18) **Choice C is correct.** (8.G.B.4) Pyramid: $V_{py} = \frac{1}{3} \times 36 \times 6 = 72 \text{ cm}^3$. Cube: $V_c = 6^3 = 216 \text{ cm}^3$. Ratio: $\frac{72}{216} = 1 : 3$.
- 19) **The correct answer is A, C.** (8.EE.C.8) Option A: Lines $y = 3x + 1$ and $y = 3x - 2$ are parallel (same slope 3, different intercepts). Option B: Different slopes (3 and $\frac{1}{3}$), so one intersection. Option C: Both equations have the form $2x + y = k$ with $k = 4$ and $k = 6$ (parallel). Option D: Lines $y = 2x$ and $x + y = 6$ have different slopes, so one intersection. Option E: Lines $y = x$ and $y = -x$ have different slopes, intersecting at the origin.
- 20) **Choice B is correct.** (8.G.B.4) Trapezoid area $= \frac{1}{2}(b_1 + b_2) \times h = \frac{1}{2}(8 + 12) \times 6 = \frac{1}{2} \times 20 \times 6 = 60 \text{ cm}^2$.
- 21) **Choice C is correct.** (8.G.A.2) The sum for a nonagon is $(9 - 2) \times 180 = 1260^\circ$. Each angle is $\frac{1260}{9} = 140^\circ$.
- 22) **Choice C is correct.** (8.SP.A.1) The points form an upward trend. As age increases, income increases, showing a positive correlation. Perfect would mean all points lie exactly on a line.
- 23) **Choice B is correct.** (8.SP.A) Among high-income households (total 60), those without internet = 5. Relative frequency $= \frac{5}{60} \approx 0.083$.
- 24) **Choice A is correct.** (8.SP.B.4) $P(\text{tails}) = \frac{1}{2}$; $P(5 \text{ or } 6) = \frac{2}{6}$. Product: $\frac{1}{2} \times \frac{2}{6} = \frac{2}{12} = \frac{1}{6}$.
- 25) **Choice B is correct.** (8.SP.B.4) First sock: 8 choices. Second sock: 7 remaining (since it must be different). Total: $8 \times 7 = 56$.
- 26) **Choice B is correct.** (8.SP.A.2) Shoe size and favorite color have no clear logical or numerical relationship, so we would expect no meaningful correlation.
- 27) **Choice B is correct.** (8.G.A.1) Perimeter of first triangle is 15 cm. Scale factor is $\frac{60}{15} = 4$. Each side of the second is $5 \times 4 = 20$ cm.
- 28) **Choice D is correct.** (8.NS.A.1) Since $4^2 = 16$ and $5^2 = 25$, and $16 < 18 < 25$, we have $4 < \sqrt{18} < 5$. More precisely, $\sqrt{18} \approx 4.24$.



Hi, Persistent Problem Solver!

◇ Some Grade 8 questions ask you to hold several ideas in your mind at once. That can feel hard, and that is exactly why practice matters. ◇

★ **Remember this:** You showed persistence by continuing through the set. That habit is powerful because difficult problems often open after one more good attempt. You practiced across 5 full Grade 8 practice tests, and that repeated effort matters. ★

Persistence Tools

- **Try a Smaller Case:** Use an easier number to see the pattern.
- **Draw It:** Make the situation visible.
- **Restate It:** Say the question in your own words.
- **Check One Step:** Fix the first unclear place.

Grade 8 test-day tip: When stuck, do not restart everything. Find the first step you trust, then rebuild from there.

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

Jay Daie

Your Persistence Coach

Practice Today. Succeed Tomorrow!

Give your child the confidence and skills they need with **5 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 |
| ✓ Measurement & Data | ✓ And More! |

5
PRINTED
TESTS



2 ONLINE
TESTS



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