

7

Vermont VT CAP

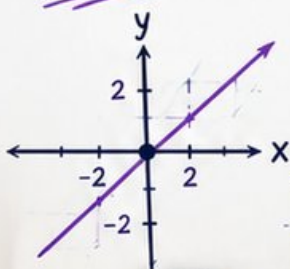
GRADE 8

MATH

PRACTICE TESTS

Standards Aligned Problem Solving
For Comprehensive Assessment Programs

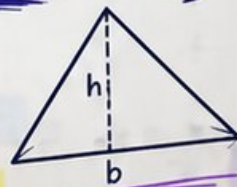
$$y = mx + b$$



**BUILD
CONFIDENCE.
SHARPEN SKILLS.
ACE YOUR
EXAM!**

Practice
Today
Succeed
Tomorrow!

$$A = \frac{1}{2}bh$$



7 PRINTED
TESTS



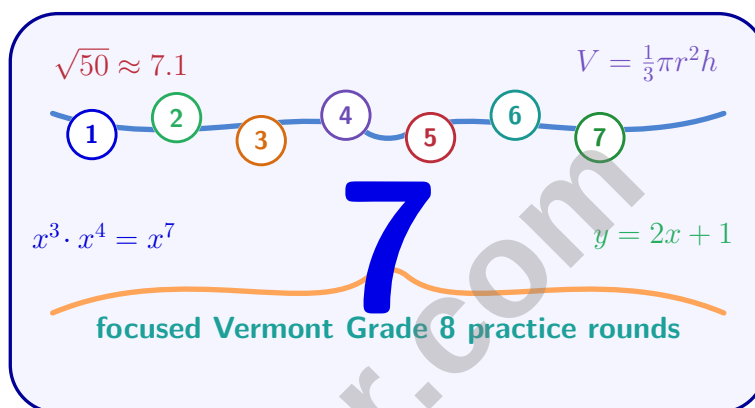
2 ONLINE
TESTS



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

7 Vermont VTCAP Grade 8 Math Practice Tests

VTCAP Review with Seven Grade 8 Tests and Complete Answer Support



Seven complete 40-question Grade 8 VTCAP 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, Vermont Grade 8 Problem Solver!

Seven focused rounds for sharper VTCAP math thinking

This book gives you seven full Grade 8 VTCAP 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 Vermont 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 seven-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.

Vermont 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?

Seven VTCAP tests, 280 questions, and a complete review path

Part	What You Will Practice
Tests 1–3	Real and irrational numbers, integer exponents, scientific notation, equations, and careful reading.
Tests 4–6	Slope, systems of equations, functions, inequalities, transformations, congruence, and similarity.
Test 7	Pythagorean reasoning, volume, data analysis, linear models, probability, mixed review, and stamina.
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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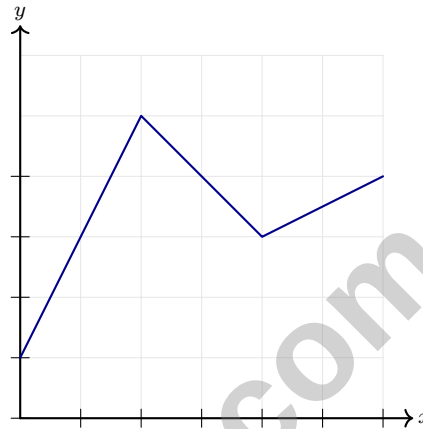
1) Which system below can be solved by the elimination shown: adding the two equations to eliminate y ?

☐ A. $3x + y = 10$ and $2x + y = 7$

☐ C. $x - 2y = 3$ and $2x + y = 5$

☐ B. $4x + 3y = 12$ and $2x - 3y = 6$

☐ D. $5x + 2y = 11$ and $3x + y = 6$



2)

Identify the maximum value and where it occurs.

☐ A. Max = 1 at $x = 4$

☐ C. Max = 3 at $x = 1$

☐ B. Max = 3 at $x = 2$

☐ D. Max = 4 at $x = 6$

3) Which pair of points has a distance of exactly 10 units?

☐ A. (0, 0) and (6, 8)

☐ C. (2, 3) and (3, 4)

☐ B. (1, 1) and (8, 8)

☐ D. (0, 5) and (5, 0)



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4) What is the relationship between an interior angle and its adjacent exterior angle of a polygon?

- ☐ A. They are equal. ☐ C. They sum to 360° .
☐ B. They sum to 180° . ☐ D. The interior angle is always larger.

5) A triangle has a perimeter of 15 inches. If the triangle is dilated by a scale factor of $\frac{1}{2}$, what is the perimeter of the dilated triangle?

- ☐ A. 30 inches ☐ C. 15 inches
☐ B. 7.5 inches ☐ D. 10 inches

6) Which inequality represents “the product of a number and -2 is greater than 8”?

- ☐ A. $-2x > 8$ ☐ C. $-2x < 8$
☐ B. $2x > 8$ ☐ D. $x > -4$

7) A principal of \$3,000 is invested at 5% compound interest annually. What is the amount after 2 years (rounded to nearest cent)?

8) Which set of side lengths does NOT form a right triangle?

- ☐ A. 9, 12, 15 ☐ C. 7, 9, 11
☐ B. 8, 6, 10 ☐ D. 20, 21, 29



- 9) A sphere and a cylinder both have radius 2 cm. The cylinder has height 8 cm. Which solid has greater volume? (Use $\pi \approx 3.14$.)
- ☐ A. Sphere ($\approx 33.49 \text{ cm}^3$) ☐ C. Both have equal volume
☐ B. Cylinder ($\approx 100.48 \text{ cm}^3$) ☐ D. Cannot determine from given data
- 10) The cost of a gym membership is \$50 per month. If Sarah spends a total of \$200 after t months, write and solve an equation to find t . Verify your answer.

- 11) Expand $(x - 7)^2$.
- ☐ A. $x^2 - 49$ ☐ C. $x^2 - 14x + 49$
☐ B. $x^2 + 14x + 49$ ☐ D. $x^2 - 7x + 49$
- 12) A line passes through (1, 3) and (3, 7). Is this a linear relationship?
- ☐ A. No, the slope is not 1 ☐ C. Yes, a line is always linear
☐ B. No, because you need more than two points ☐ D. Yes, only if the slope is positive
- 13) The equation $C = 25t + 80$ represents the total cost of a phone plan, where t is the number of months. What does the 80 represent?
- ☐ A. Monthly cost of \$25 ☐ C. Number of months
☐ B. Equipment fee of \$80 ☐ D. Total cost after 1 month



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1) Which equation is NONLINEAR?

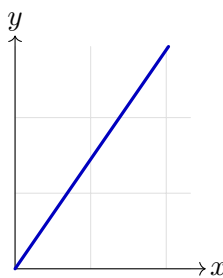
☐ A. $y = \frac{5}{2}x - \frac{3}{4}$

☐ B. $y = 10 + 0.5x$

☐ C. $y = 4x^{-1}$

☐ D. $y = -8x + 11$

2) Which point must be on the graph of $y = 2x$?



☐ A. (1, 2)

☐ B. (1, 3)

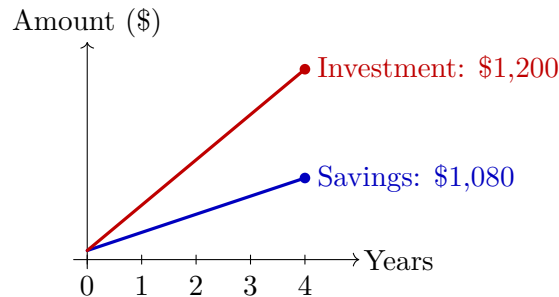
☐ C. (2, 1)

☐ D. (0, 2)

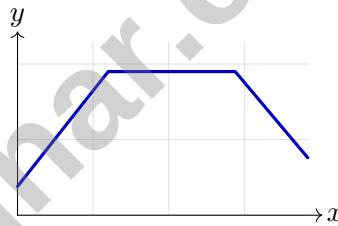
3) The system $\begin{cases} 2x - y = 5 \\ 4x - 2y = 10 \end{cases}$ has how many solutions?

☐ A. No solution☐ B. Exactly one solution☐ C. Exactly two solutions☐ D. Infinitely many solutions

- 4) A student invests \$1,000 and compares: saving account at 2% simple interest vs investing at 5% simple interest for 4 years. What is the difference in final amounts?



- ☐ A. \$60 ☐ C. \$120
☐ B. \$80 ☐ D. \$200
- 5) A runner's speed increases for the first 5 minutes, stays constant for 10 minutes, then decreases as they cool down. Which graph shape represents this?



- ☐ A. Three straight segments: rising, flat, falling ☐ C. A U-shaped parabola
☐ B. A curve that rises steeply, then flat, then falls ☐ D. A line with constant positive slope
- 6) Points $(-1, 5)$ and $(2, 14)$ lie on a line. Find the slope.



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1) A student incorrectly wrote 56,200 in scientific notation as 56.2×10^3 . What is the correct form?

☐ A. 562×10^2

☐ C. 56.2×10^3

☐ B. 5.62×10^3

☐ D. 5.62×10^4

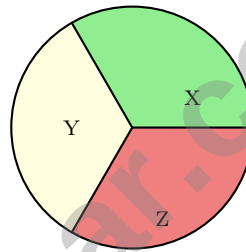
2) If two groups of students both have mean score 80 but Group 1 MAD = 2 and Group 2 MAD = 10, which is true?

☐ A. Group 2 has higher overall achievement

☐ C. Group 1 scores are more uniform

☐ B. Group 1 has more students

☐ D. Both groups have identical scores



3)

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. $\frac{1}{6}$

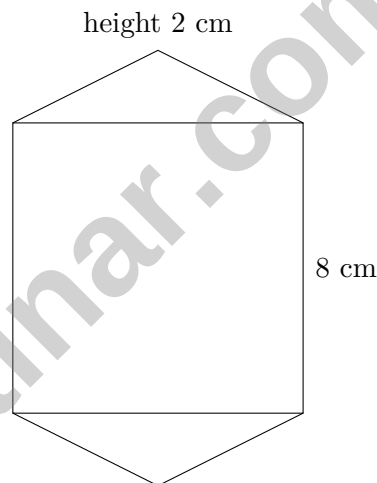
4) A rectangular pyramid has a base 8 m by 5 m and a volume of 240 m^3 . What is its height?



- 5) A game involves picking a number (1, 2, or 3) and a letter (A or B). The table lists some outcomes. How many total outcomes should the complete table show?

Number	A	B
1	(1,A)	(1,B)
2	(2,A)	(2,B)
3	(3,A)	(3,B)

- ☐ A. $3 + 2 = 5$ ☐ C. $2^3 = 8$
☐ B. $3 \times 2 = 6$ ☐ D. $3^2 = 9$
- 6) A composite figure has a square base (8 cm by 8 cm) with triangular flaps on two opposite sides (base 8 cm, height 2 cm each). What is the total area in cm^2 ?



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Vermont VTCAP 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 Vermont VTCAP practice test.

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Practice Test Answers and Explanations

Practice Test 1 Answers and Explanations

- 1) **Choice B is correct.** (8.EE.C.8a) In option B, the y coefficients are $+3$ and -3 . Adding these equations eliminates y : $(4x + 3y) + (2x - 3y) = 12 + 6 \Rightarrow 6x = 18$.
- 2) **Choice B is correct.** (8.F.B.5) The highest point on the graph is at the second vertex, $(2, 3)$. All other points are lower.
- 3) **Choice A is correct.** (8.G.B.8) Distance $= \sqrt{6^2 + 8^2} = \sqrt{36 + 64} = \sqrt{100} = 10$ units.
- 4) **Choice B is correct.** (8.G.A.5) An interior angle and its adjacent exterior angle are supplementary—they form a straight line and sum to 180° .
- 5) **Choice B is correct.** (8.G.A.4) Perimeter scales linearly with the scale factor. $15 \times \frac{1}{2} = 7.5$ inches. A scale factor less than 1 creates a reduction.
- 6) **Choice A is correct.** (8.EE.C.8b) “Product of a number and -2 ” is $-2x$; “greater than 8” is > 8 .
- 7) **The correct answer is \$3,307.50.** (8.G.B.7) $A = 3000(1.05)^2 = 3000 \times 1.1025 = \$3,307.50$.
- 8) **Choice C is correct.** (8.G.B.6, 8.G.B.7) Check C: $7^2 + 9^2 = 49 + 81 = 130 \neq 121 = 11^2$. All others satisfy the Pythagorean Theorem (A: 9-12-15 is 3-4-5 scaled by 3; B: 6-8-10 is 3-4-5 scaled by 2; D: 20-21-29 is a Pythagorean triple).
- 9) **Choice B is correct.** (8.G.C.9) Sphere: $V = \frac{4}{3} \times 3.14 \times 8 = 33.49 \text{ cm}^3$. Cylinder: $V = 3.14 \times 4 \times 8 = 100.48 \text{ cm}^3$. Cylinder is larger.
- 10) **The correct answer is $t = 4$ months.** (8.EE.C.7) The equation is $50t = 200$. Divide both sides by 50: $t = 4$ months. Verify: $50(4) = 200 \checkmark$.
- 11) **Choice C is correct.** (8.EE.C.7) $(x - 7)^2 = (x - 7)(x - 7) = x^2 - 7x - 7x + 49 = x^2 - 14x + 49$.
- 12) **Choice C is correct.** (8.F.A.3) By definition, a line represents a linear function. Since the graph is a line, the relationship is linear.
- 13) **Choice B is correct.** (8.F.B.4) The constant term 80 is the y -intercept, which is the initial cost when $t = 0$ (before any monthly charges). This one-time equipment fee is paid at the start.
- 14) **Choice B is correct.** (8.G.A.3) The rule for 90° counterclockwise rotation is $(x, y) \rightarrow (-y, x)$. So $(6, 8) \rightarrow (-8, 6)$.
- 15) **Choice C is correct.** (8.G.A.5) The angles sum to 180° : $4x + (2x + 10) + (3x - 10) = 180$, so $9x = 180$ and $x = 20$. Therefore angle $P = 4x = 80^\circ$.
- 16) **Choice C is correct.** (8.G.B.7) Four angles around an intersection point sum to 360° . If one angle is b , the sum of the other three is $360 - b$.
- 17) **Choice A is correct.** (8.G.C.9) $V = \frac{1}{3} \times 25 \times 9 = 75 \text{ cm}^3$.
- 18) **The correct answer is A, D.** (8.EE.B.5) Line 1: $k = \frac{6}{4} = 1.5$, so $y = 1.5x$ (\$1.50/lb). Line 2: $k = \frac{12}{6} = 2$, so $y = 2x$ (\$2.00/lb). A is correct (Line 1 equation and price). D is correct (Line 2 has greater slope: $2 > 1.5$). C is wrong (Line 2 is steeper, not Line 1). B is correct but not a correct pair; E is subjective (worse deal, not better). Answer: A and D.
- 19) **Choice B is correct.** (8.G.B.7) Trapezoid area $= \frac{1}{2}(b_1 + b_2) \times h = \frac{1}{2}(4 + 6) \times 2 = 10 \text{ m}^2$.
- 20) **Choice D is correct.** (8.SP.A.1) The pattern shows: high experience (right) $\rightarrow$ low reaction time (bottom), and low experience (left) $\rightarrow$ high reaction time (top). This is a negative association: as one increases, the other decreases.
- 21) **Choice A is correct.** (8.SP.A.4) This is a column-conditional frequency. Among tea drinkers (90 total), afternoon drinkers are 40. Relative frequency: $\frac{40}{90} \approx 0.44$.
- 22) **Choice B is correct.** (8.G.B.8) Absolute deviations: $|4 - 6| = 2$, $|4 - 6| = 2$, $|8 - 6| = 2$, $|8 - 6| = 2$. Sum = 8. MAD $= 8/4 = 2$.
- 23) **Choice C is correct.** (8.G.B.7) $P(\text{section 1 all three times}) = \frac{1}{4} \times \frac{1}{4} \times \frac{1}{4} = \frac{1}{64}$.
- 24) **Choice B is correct.** (8.EE.C.7b) Assign instrument 1 to any of 7 musicians, instrument 2 to any of the remaining 6, instrument 3 to any of the remaining 5: $7 \times 6 \times 5 = 210$. (This is $P(7, 3)$, a permutation because the instruments are distinguishable.)
- 25) **Choice B is correct.** (8.SP.A.2) Both have slope $m = -2$ but intercepts of 5 and -3 respectively. These are parallel lines.



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Hi, Calm Solver!

◇ This broad and demanding book gave you seven strong Grade 8 practice tests, so you had repeated chances to build accuracy, pacing, and confidence. A calm mind can see choices more clearly. That matters in Grade 8, where one problem may have several possible entry points. ◇

★ **Remember this:** You practiced building calm by doing full tests. Each completed page is rehearsal for staying steady when the real test feels serious. ★

Calm-Test Moves

- **Pause:** Give your brain one quiet second.
- **Choose:** Pick the first useful step.
- **Continue:** Do not demand perfection immediately.
- **Check:** Use review time wisely.

Grade 8 test-day tip: If you feel rushed, slow your reading for one sentence. Clear reading saves time.

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

Jay Daie

Your Calm-Test Coach

PRACTICE TODAY SUCCEED TOMORROW!

Give your child the confidence and skills they need with **7 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!

GRADE 8

Practice
Today
Succeed
Tomorrow!

Algebra

Geometry

Statistics

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.



Build Skills & Boost Confidence

Strengthen understanding and feel prepared for test day.

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! |



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