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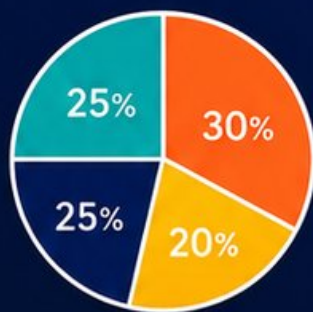
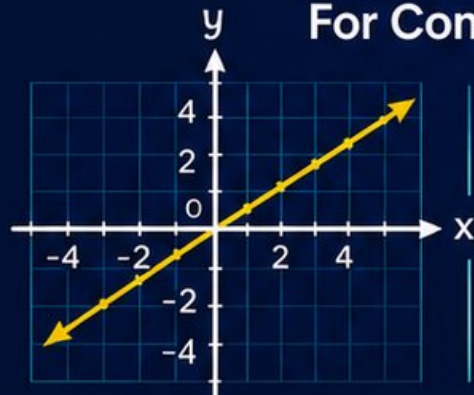
Vermont VT'CAP

GRADE 8

MATH

PRACTICE TESTS

Standards Aligned Problem Solving
For Comprehensive Assessment Programs

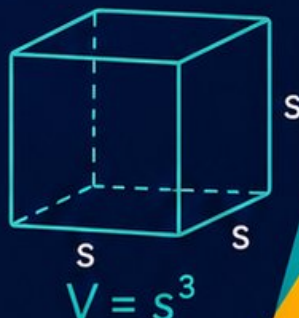


$$y = mx + b$$

$$2x - 3y = 6$$

$$\sqrt{x^2 + y^2}$$

$$A = bh$$



**4 PRINTED
TESTS**



**2 ONLINE
TESTS**

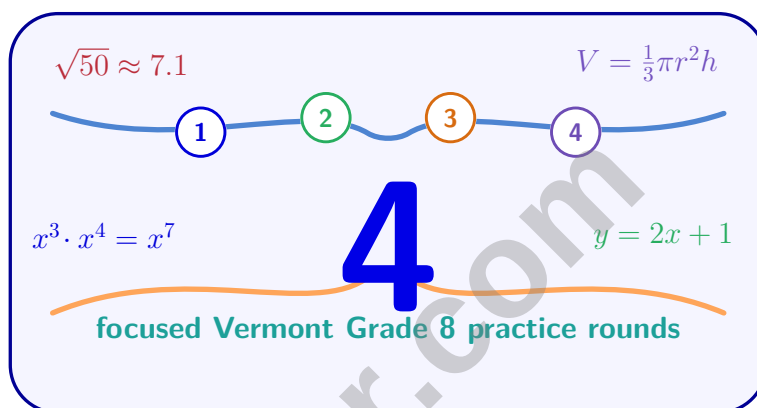


Use these **two additional online practice tests**
for extra review after the printed tests in this book.



4 Vermont VTCAP Grade 8 Math Practice Tests

Focused VTCAP Practice for Grade 8 Skills and Test Readiness



Four 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!

Four focused rounds for sharper VTCAP math thinking

This book gives you four 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 four-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?

Four VTCAP tests, 160 questions, and a focused review path

Part	What You Will Practice
Tests 1–2	Real numbers, exponents, scientific notation, equations, and careful reading.
Tests 3–4	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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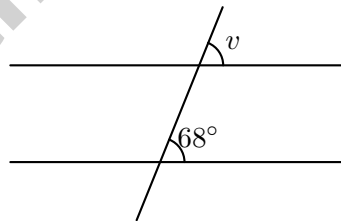
- 1) A store offers a warranty on a \$600 laptop for \$89. The warranty covers 2 years. Based on historical data, 1 in 10 laptops need repair costing an average of \$300. Is the warranty a good deal?

- ☐ A. Yes; expected repair cost is \$89 ☐ C. No; expected repair cost is \$30
☐ B. Yes; warranty costs less than ☐ D. No; warranty should be free
repairs

- 2) A water tank holds 200 gallons at 15% salinity. To reduce salinity to 10%, how much fresh water (0% salinity) should be added?

- ☐ A. 50 gal ☐ C. 100 gal
☐ B. 150 gal ☐ D. 200 gal

- 3) A car travels 180 miles in 3 hours. What is the slope (speed in miles per hour)?



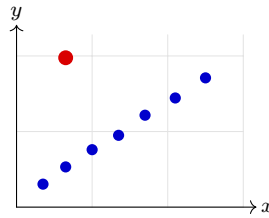
4)

Two parallel lines are cut by a transversal. The angle 68° and angle v are corresponding angles. What is v ?

- ☐ A. 22° ☐ C. 112°
☐ B. 68° ☐ D. 122°



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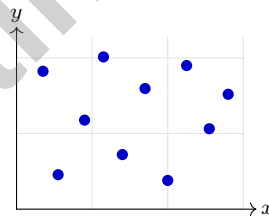
5)

A scatter plot displays student class attendance versus final exam grade. The data shows a positive linear association with a strong correlation. One student attended class 80% of the time but scored a 40% on the exam. This point is:

- ☐ A. An outlier ☐ C. The mean of the data
☐ B. A typical data point ☐ D. An error in measurement

6) Which interpretation of MAD is correct?

- ☐ A. MAD tells you the largest value in the data ☐ C. MAD is always equal to the mean
☐ B. MAD measures the typical distance of data points from the mean ☐ D. MAD is usually negative



7)

A scatter plot shows no clear pattern or trend. Which line is the best fit?

- ☐ A. A line with the steepest possible slope ☐ C. A vertical line
☐ B. A line that bounces between all the points randomly ☐ D. A horizontal line near the mean of the y -values



- 8) Triangle ABC is similar to Triangle DEF . Side $AB = 4$ cm, $BC = 5$ cm, $CA = 6$ cm. The perimeter of DEF is 45 cm. Find the length of EF .
- ☐ A. 15 cm ☐ C. 22.5 cm
☐ B. 18 cm ☐ D. 10 cm
- 9) Which expression equals a rational number?
- ☐ A. $\sqrt{2} \times \sqrt{3}$ ☐ C. $\sqrt{3} + \sqrt{3}$
☐ B. $\sqrt{4} + \sqrt{5}$ ☐ D. $\sqrt{9} \times \sqrt{4}$
- 10) A sandwich shop offers 2 types of bread and 7 topping options. How many different one-topping sandwiches can be made?
- ☐ A. $2 + 7 = 9$ ☐ C. $7^2 = 49$
☐ B. $2 \times 7 = 14$ ☐ D. $2 \times 7 \times 7 = 98$
- 11) Between which two consecutive integers does $\sqrt[3]{20}$ lie?
- ☐ A. 4 and 5 ☐ C. 3 and 4
☐ B. 1 and 2 ☐ D. 2 and 3
- 12) Which order is correct from smallest to largest?
- ☐ A. $\sqrt{2}, \sqrt{5}, \sqrt{3}$ ☐ C. $\sqrt{3}, \sqrt{2}, \sqrt{5}$
☐ B. $\sqrt{5}, \sqrt{3}, \sqrt{2}$ ☐ D. $\sqrt{2}, \sqrt{3}, \sqrt{5}$
- 13) What power of 10 completes the conversion $304,000,000 = 3.04 \times ?$
- ☐ A. 10^7 ☐ C. 10^9
☐ B. 10^6 ☐ D. 10^8



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1) Explain: Why must the inequality symbol be flipped when solving $-3x \leq 12$?

- ☐ A. Multiplying by a negative reverses the direction of the inequality
- ☐ B. It is a rule you must always follow, regardless of the sign
- ☐ C. Dividing by any negative number requires flipping
- ☐ D. Flipping prevents getting a negative variable

2) 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
- ☐ B. 3.5 inches per week
- ☐ C. 2 inches per week
- ☐ D. 7 inches per week

3) Train A travels at 60 mph. Train B travels at 75 mph. If Train B leaves 1 hour later but they meet after Train A has traveled for 5 hours, which equation is correct?

- ☐ A. $60 \cdot 5 = 75 \cdot 4$
- ☐ B. $60 \cdot 5 + 75 \cdot 4 = \text{total distance}$
- ☐ C. $60 \cdot 4 = 75 \cdot 5$
- ☐ D. $60 \cdot 5 = 75 \cdot 5$

4) A triangular pyramid has a right-triangular base with legs 9 in and 12 in, and a pyramid height of 20 in. Calculate the volume in cubic inches.

5) Given $f(x) = x^2$ and $g(x) = 2x + 1$, which statement is true?

- ☐ A. $f(3) = g(3)$
- ☐ B. $f(3) > g(3)$
- ☐ C. $f(3) < g(3)$
- ☐ D. Cannot be determined



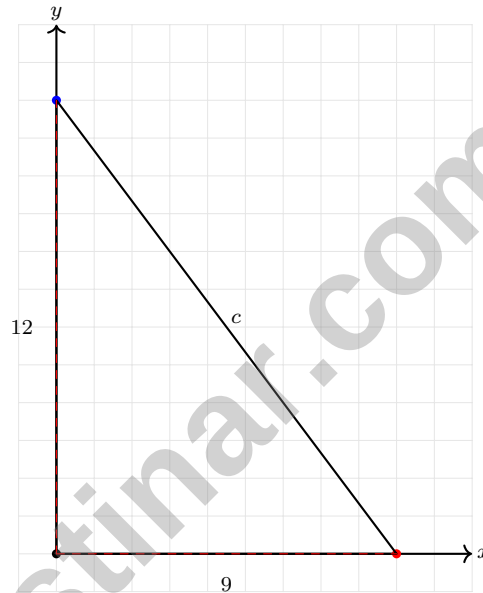
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- 6) A bag has 9 cards: 4 red, 3 blue, 2 green. Three cards are drawn without replacement. What is the probability that all three are red?

☐ A. $\frac{4}{9}$
☐ B. $\frac{24}{504}$

☐ C. $\frac{12}{504}$
☐ D. $\frac{64}{729}$

- 7) A right triangle sits on a coordinate plane with vertices at $(0,0)$, $(9,0)$, and $(0,12)$. What is the length of the hypotenuse?

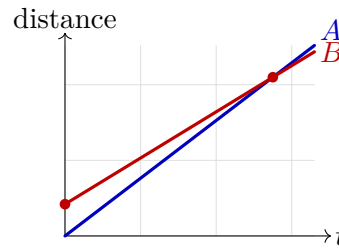


☐ A. 15
☐ B. 21

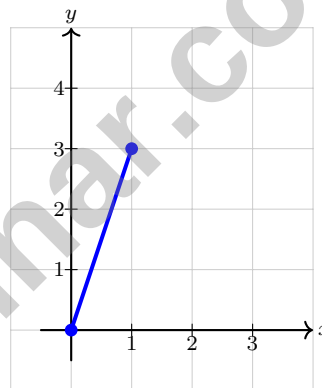
☐ C. $\sqrt{200}$
☐ D. 3



- 1) 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.
- 2) What is the slope of the line shown?



- ☐ A. 2
 ☐ C. 3
- ☐ B. $\frac{1}{3}$
☐ D. $\frac{3}{2}$
- 3) A trapezoid has a top base of 5 cm, a bottom base of 9 cm, and two equal legs. If the perimeter is 30 cm, what is the length of each leg?

- ☐ A. 6 cm
 ☐ C. 8 cm
- ☐ B. 7 cm
 ☐ D. 9 cm



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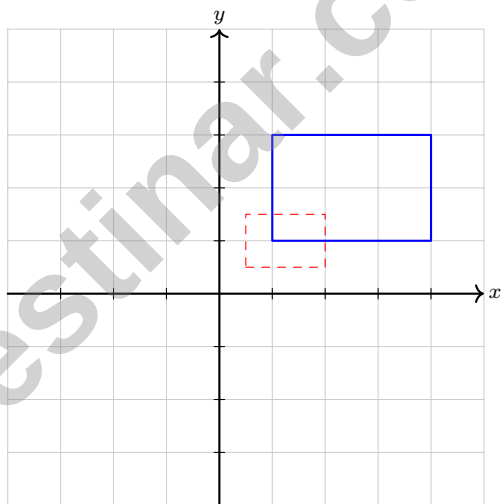
4) For the table $(0, 10)$, $(2, 14)$, $(4, 18)$, $(6, 22)$, what is the slope?

x	0	2	4	6
y	10	14	18	22

5) If $f(x) = -3x + 10$, what is $f(2)$?

- ☐ A. 4
☐ B. 16

- ☐ C. -6
☐ D. 6



6)

The blue rectangle is dilated to form the red rectangle. What is the scale factor?

- ☐ A. $\frac{1}{2}$
☐ B. 2

- ☐ C. $\frac{1}{3}$
☐ D. 3



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 C is correct.** (8.G.B.7) Expected repair cost = $0.1 \times 300 = \$30$. Since the warranty costs \$89, it costs more than the expected repair cost.
- 2) **Choice C is correct.** (8.EE.C.8c) Initial salt: $0.15(200) = 30$ gallons. After adding x gallons of fresh water: total volume = $200 + x$, salt amount = 30. Setting salinity to 10%: $\frac{30}{200+x} = 0.10$, so $30 = 0.10(200 + x) = 20 + 0.10x$, giving $0.10x = 10$, thus $x = 100$ gal.
- 3) **The correct answer is 60.** (8.EE.B.5) Slope = $\frac{180 \text{ miles}}{3 \text{ hours}} = 60$ miles per hour.
- 4) **Choice B is correct.** (8.G.B.7) Corresponding angles are congruent when a transversal cuts parallel lines. So $v = 68^\circ$.
- 5) **Choice A is correct.** (8.SP.A.1) The point lies far below the line of best fit, deviating from the expected positive correlation between attendance and exam grade.
- 6) **Choice B is correct.** (8.G.B.8) MAD represents the average distance each value is from the mean, showing variability. It cannot be negative because it uses absolute values.
- 7) **Choice D is correct.** (8.SP.A.2) When there is no clear trend (no correlation), data appears randomly scattered. The best fit is a horizontal line at the average y -value, since no slope can be meaningfully determined.
- 8) **Choice A is correct.** (8.G.A.4) Perimeter of ABC is $4 + 5 + 6 = 15$ cm. Scale factor is $\frac{45}{15} = 3$. The side corresponding to $BC = 5$ is $EF = 5 \times 3 = 15$ cm.
- 9) **Choice D is correct.** (8.NS.A.1) $\sqrt{9} \times \sqrt{4} = 3 \times 2 = 6$, which is rational. The other expressions yield irrationals: $\sqrt{3} + \sqrt{3} = 2\sqrt{3}$, $\sqrt{4} + \sqrt{5} = 2 + \sqrt{5}$, and $\sqrt{2} \times \sqrt{3} = \sqrt{6}$.
- 10) **Choice B is correct.** (8.EE.C.7b) Choose one bread and one topping: $2 \times 7 = 14$ different sandwiches.
- 11) **Choice D is correct.** (8.NS.A.2) $2^3 = 8$ and $3^3 = 27$. Since $8 < 20 < 27$, we have $2 < \sqrt[3]{20} < 3$.
- 12) **Choice D is correct.** (8.NS.A.2) $\sqrt{2} \approx 1.41$, $\sqrt{3} \approx 1.73$, $\sqrt{5} \approx 2.24$, so the order is increasing.
- 13) **Choice D is correct.** (8.EE.A.3) Moving the decimal 8 places left to get 3.04 gives the exponent 8.
- 14) **Choice B is correct.** (8.G.C.9) Let side length = s . Then $SA = 2(s^2 + s \cdot s + s \cdot s) = 2(s^2 + 2s^2) = 2(3s^2) = 6s^2 = 150$. So $s^2 = 25$, giving $s = 5$ cm.
- 15) **The correct answer is -2 .** (8.F.A.2) Slope: $(14 - 2)/(4 - 1) = 4$. From $(1, 2)$: $2 = 4(1) + b \Rightarrow b = -2$.
- 16) **Choice D is correct.** (8.G.A.1) A full 360° rotation completes one full turn, bringing the figure back unchanged. This is the identity transformation.
- 17) **Choice D is correct.** (8.EE.B.6) The correct slope is $\frac{9-3}{4-1} = \frac{6}{3} = 2$. The student computed $\frac{4-1}{9-3} = \frac{3}{6} = \frac{1}{2}$, reversing the roles of Δx and Δy .
- 18) **Choice A is correct.** (8.EE.C.7) Total cost is adult tickets plus child tickets. If a adults, then $(6 - a)$ children. Equation: $12a + 8(6 - a) = 60$.
- 19) **Choice B is correct.** (8.EE.C.8b) SOLID line means the boundary is INCLUDED ($\leq$ or $\geq$). Shading to the LEFT means x values are at most 4, so $x \leq 4$.
- 20) **Choice C is correct.** (8.G.C.9) Radius $r = 6$ ft. From $V = \pi r^2 h$: $1130.4 = 3.14 \times 36 \times h \Rightarrow h = \frac{1130.4}{113.04} = 10$ ft.
- 21) **The correct answer is A,B.** (8.F.A.1) Verify each value: $f(1) = 3$ and $f(3) = 7$, so A and B are correct. Also, $f(2) = 5$, $f(0) = 1$, and $f(4) = 9$, so C, D, and E are false.
- 22) **Choice A is correct.** (8.SP.A.3) The slope is the rate of change. A slope of 1.5 means for every 1-unit increase in x , y increases by 1.5.
- 23) **Choice D is correct.** (8.NS.A.1) The repeating block 26 has 2 digits, so we multiply by $10^2 = 100$. This shifts the decimal 2 places to align the repeating parts for subtraction.
- 24) **Choice D is correct.** (8.EE.A.1) When raising a power to another power, multiply exponents: $(y^4)^3 = y^{4 \cdot 3} = y^{12}$.
- 25) **Choice D is correct.** (8.EE.A.2) $4 \times 4 \times 4 = 64$, so $\sqrt[3]{64} = 4$.
- 26) **Choice C is correct.** (8.EE.A.4) Correct rule: multiply coefficients and add exponents. The student got $2 \times 4 = 8$ correct, but mistakenly multiplied $3 \times 4 = 12$ instead of adding $3 + 4 = 7$.
- 27) **Choice C is correct.** (8.EE.B.5) Unit rate $k = \frac{48}{2} = 24$ bacteria per hour.



Hi, Strategy Solver!

◇ Grade 8 math rewards students who think before they calculate. You practiced choosing strategies, not just hunting for answers. This carefully paced book gave you four steady Grade 8 practice tests, so you had repeated chances to build accuracy, pacing, and confidence. ◇

★ **Remember this:** That matters because stronger math students do not use one method for every question. They notice the structure and choose the tool that fits. ★

Strategy Moves

- **Estimate:** Know the neighborhood of the answer.
- **Simplify:** Rewrite numbers in friendlier forms.
- **Model:** Draw what the words describe.
- **Verify:** Put the answer back into the problem.

Grade 8 test-day tip: Pause for ten seconds before hard questions. A short plan can save several minutes.

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

Jay Daie

Your Strategy Guide

PRACTICE TODAY, ACHIEVE TOMORROW!

Give your child the confidence and skills they need with **4 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!

4



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



4 PRINTED TESTS

+



2 ONLINE TESTS



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