

3

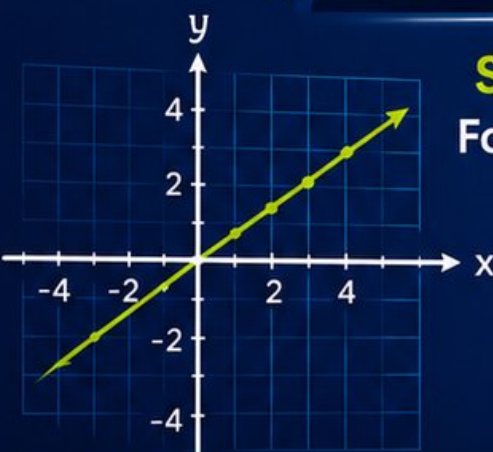
Vermont VTCAP

GRADE 8

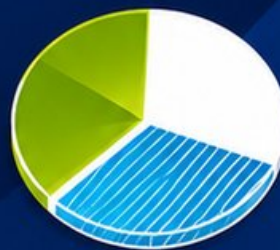
MATH

PRACTICE TESTS

Standards Aligned Problem Solving
For Comprehensive Assessment Programs



$$V = s^3$$



$$y = mx + b$$
$$2x + 5 = 13$$
$$x = 4$$



3

**PRINTED
TESTS**



2

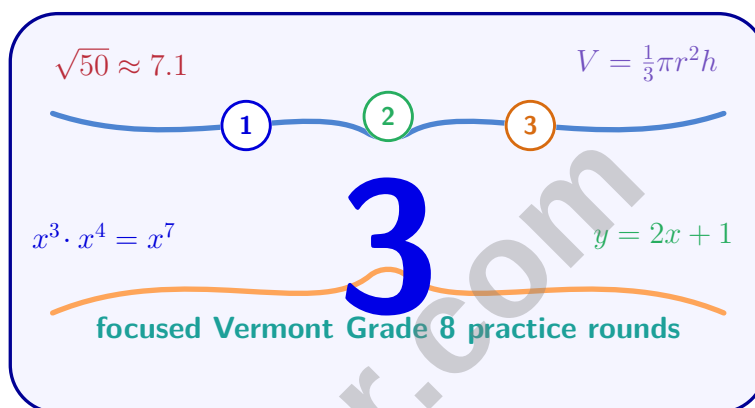
**ONLINE
TESTS**



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

3 Vermont VTCAP Grade 8 Math Practice Tests

Three Grade 8 VTCAP Rounds for Confident Review



Three 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!

Three focused rounds for sharper VTCAP math thinking

This book gives you three 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 three-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?

Three VTCAP tests, 120 questions, and a focused review path

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

Table of Contents



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1) If $x = 0.\overline{36}$, which shows the first equation in the standard method?

☐ A. $10x = 0.36$

☐ C. $36x = 0.\overline{36}$

☐ B. $1000x = 360.\overline{36}$

☐ D. $100x = 36.\overline{36}$

2) A composite solid consists of a cube with edge 2 cm on top of a rectangular prism base with dimensions $4 \times 4 \times 3$ cm (where the cube sits on one face of the prism, sharing a 2×2 face). Ignoring the shared face, what is the combined surface area?

☐ A. 60 cm^2

☐ C. 84 cm^2

☐ B. 76 cm^2

☐ D. 96 cm^2

3) Under which transformation would the image of a point (x, y) always lie on the opposite side of the origin from the original point?

☐ A. Reflection across the x -axis☐ C. 180° rotation about the origin☐ B. Reflection across the y -axis☐ D. Translation 5 units right

4) A virus has diameter 1.2×10^{-7} m. Bacteria has diameter 8×10^{-6} m. How many times larger is the bacterium than the virus?

5) What is the y -intercept of $y = -\frac{1}{2}x + 4$?

☐ A. $-\frac{1}{2}$

☐ C. -4

☐ B. $\frac{1}{2}$

☐ D. 4



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6) Solve for x : $3(x + 1) = 2(x + 4)$

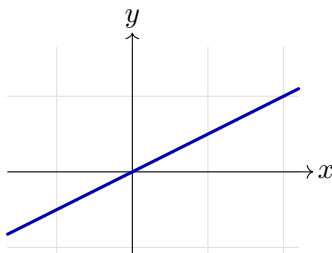
☐ A. $x = 2$

☐ C. $x = -1$

☐ B. $x = 8$

☐ D. $x = 5$

7) Graph $y \geq \frac{1}{2}x$. Which region should be shaded?



☐ A. Below the line only

☐ C. Above and on the line

☐ B. Above the line only

☐ D. Below and on the line

8) A cone has the same radius and height as a cylinder. If the cylinder's volume is 450 cubic meters, what is the cone's volume?

☐ A. 150 m^3

☐ C. 900 m^3

☐ B. 225 m^3

☐ D. 1350 m^3

9) Which pair of points lies on the line $y = 3x + 2$?

☐ A. $(0, 2)$ and $(1, 4)$

☐ C. $(2, 9)$ and $(3, 11)$

☐ B. $(1, 5)$ and $(0, 3)$

☐ D. $(1, 5)$ and $(2, 8)$

10) Simplify $\frac{a^4b^3}{a^2b}$.

☐ A. a^2b^{-2}

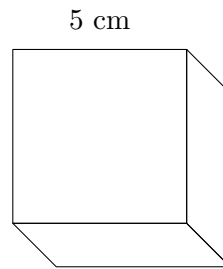
☐ C. $\frac{a^6b^4}{a^2b^2}$

☐ B. a^2b^3

☐ D. $\frac{a^2b^2}{1}$ or a^2b^2



11) If a cube has a side length of 5 cm, what is its volume?



☐ A. 15 cm^3

☐ B. 25 cm^3

☐ C. 75 cm^3

☐ D. 125 cm^3

12) $(7.2 \times 10^5) \times (1.5 \times 10^3) = ?$

☐ A. 10.8×10^8

☐ B. 1.08×10^{15}

☐ C. 8.7×10^8

☐ D. 1.08×10^9

13) A computer downloads files at 15 MB per second. How many MB are downloaded in 2.5 seconds?

☐ A. 30 MB

☐ B. 35 MB

☐ C. 37.5 MB

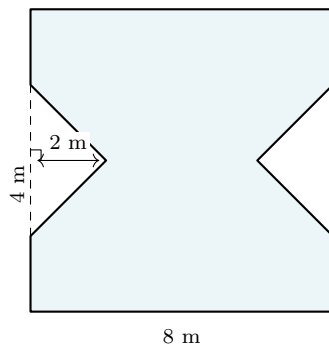
☐ D. 40 MB



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- 1) A composite figure has a square (8 m by 8 m) with two opposite triangular notches cut out (each 4 m base, 2 m height). What is the remaining area?



- ☐ A. 56 m^2
☐ B. 60 m^2

- ☐ C. 64 m^2
☐ D. 72 m^2

2)

Candidate	Square
9.3	86.49
9.4	88.36

$\sqrt{88}$ is between 9 and 10. Is it closer to 9.3 or 9.4?

- ☐ A. 9.3
☐ B. Cannot determine

- ☐ C. Equally close
☐ D. 9.4

3) Which statement is true?

- ☐ A. $\sqrt{36}$ is irrational
☐ B. π is rational

- ☐ C. $\sqrt{11}$ is irrational
☐ D. $0.333\ldots$ is irrational



4) Divide $\frac{8.4 \times 10^6}{2.1 \times 10^3}$. Express in scientific notation.

☐ A. 4×10^2

☐ C. 6.3×10^3

☐ B. 0.4×10^2

☐ D. 4×10^3

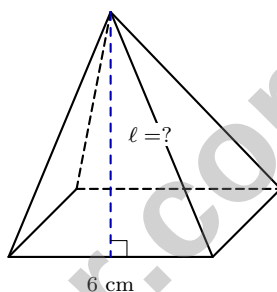
5) A principal of \$5,000 is invested at 6% compound interest annually for 2 years. What is the total amount?

☐ A. \$5,300

☐ C. \$5,618

☐ B. \$5,600

☐ D. \$5,900



6)

A square pyramid has a square base with side 6 cm and total surface area 96 cm^2 . Find the slant height ℓ .

☐ A. 4 cm

☐ C. 6 cm

☐ B. 5 cm

☐ D. 8 cm

7) Two congruent triangles are positioned as shown. Triangle A is at vertices $(1, 1)$, $(3, 1)$, $(2, 3)$. Triangle B is at vertices $(1, -1)$, $(3, -1)$, $(2, -3)$. What transformation(s) map A to B?

☐ A. A single reflection across the x -axis

☐ C. A reflection across the x -axis followed by a reflection across the y -axis

☐ B. A single reflection across the y -axis

☐ D. A single translation downward



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1) Which pair of irrational numbers, when multiplied, produces a rational number?

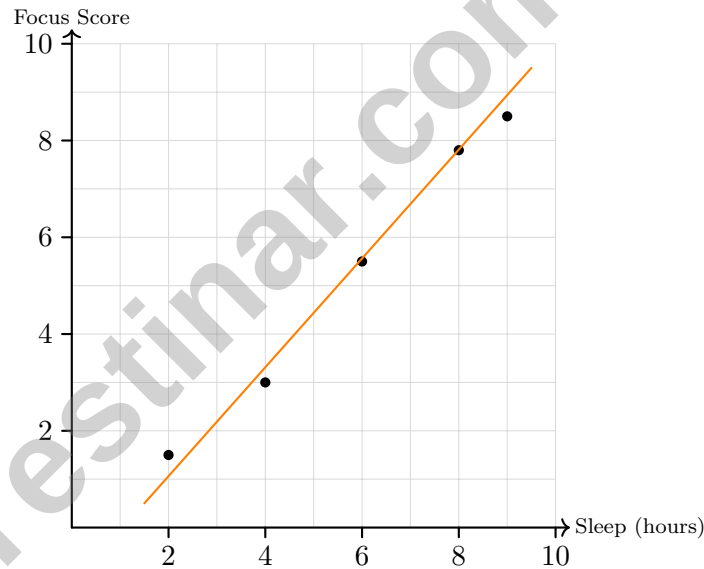
☐ A. $\sqrt{3} \times \sqrt{5}$

☐ C. $\sqrt{6} \times \sqrt{10}$

☐ B. $\sqrt{7} \times \sqrt{11}$

☐ D. $\sqrt{2} \times \sqrt{8}$

2) A piggy bank has nickels and dimes totaling \$2.75. There are twice as many dimes as nickels. How many nickels are in the bank?



3)

Based on the trend line, if a student sleeps 7 hours, what is the predicted focus score?

☐ A. Approximately 5

☐ C. Approximately 7

☐ B. Approximately 6

☐ D. Approximately 8

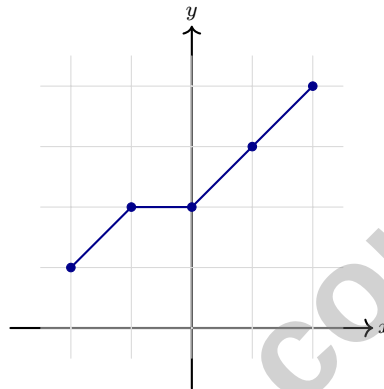


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- 4) Pentagons $ABCDE$ and $FGHIJ$ are similar. Side $AB = 7$ cm and the corresponding side $FG = 14$ cm. If $BC = 9$ cm, what is the length of GH ?

☐ A. 4.5 cm☐ C. 9 cm☐ B. 18 cm☐ D. 11.5 cm

- 5) From the graph of $f(x)$, what is $f(-1)$?

☐ A. -1☐ C. 1☐ B. 2☐ D. 3

- 6) To the nearest tenth, which is the best estimate for $\sqrt{56}$?

☐ A. 7.0☐ C. 8.0☐ B. 6.0☐ D. 7.5

- 7) Which expression is larger: $\sqrt{5} + \sqrt{6}$ or 4.8?

☐ A. $\sqrt{5} + \sqrt{6}$ is larger☐ C. They are equal☐ B. Cannot be determined☐ D. 4.8 is larger

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.



Scan me!
For more practice
& answers

Practice Test Answers and Explanations

Practice Test 1 Answers and Explanations

- 1) **Choice D is correct.** (8.NS.A.1) Since the block has 2 digits, multiply x by $10^2 = 100$. This gives $100x = 36.363636... = 36.\overline{36}$.
- 2) **Choice D is correct.** (8.G.C.9) The rectangular prism has surface area $2(16 + 12 + 12) = 80 \text{ cm}^2$. The cube has surface area $6(2^2) = 24 \text{ cm}^2$. The shared 2×2 face is counted twice, so subtract $2(4)$. The composite surface area is $80 + 24 - 8 = 96 \text{ cm}^2$.
- 3) **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.
- 4) **The correct answer is 66.67.** (8.EE.A.3) Divide: $\frac{8 \times 10^{-6}}{1.2 \times 10^{-7}} = \frac{8}{1.2} \times 10^1 = 6.67 \times 10^1 \approx 66.67$.
- 5) **Choice D is correct.** (8.EE.B.6) The y -intercept is the constant term b in $y = mx + b$, which is 4.
- 6) **Choice D is correct.** (8.EE.C.7) Expand: $3x + 3 = 2x + 8$. Subtract $2x$ and 3: $x = 5$.
- 7) **Choice C is correct.** (8.EE.C.8b) The inequality $\geq$ means "greater than or equal," so shade ABOVE the line. The SOLID line is included in the solution.
- 8) **Choice A is correct.** (8.G.C.9) Since $V_{\text{cone}} = \frac{1}{3}V_{\text{cyl}}$, the cone's volume is $\frac{1}{3} \times 450 = 150 \text{ m}^3$.
- 9) **Choice D is correct.** (8.SP.A.3) Check $(1, 5)$: $5 = 3(1) + 2 = 5 \checkmark$. Check $(2, 8)$: $8 = 3(2) + 2 = 8 \checkmark$.
- 10) **Choice D is correct.** (8.EE.A.1) Quotient rule for each variable: $\frac{a^4}{a^2} = a^2$ and $\frac{b^3}{b} = b^2$. Result: a^2b^2 .
- 11) **Choice D is correct.** (8.EE.A.2) Volume of a cube $= s^3 = 5^3 = 125 \text{ cm}^3$.
- 12) **Choice D is correct.** (8.EE.A.4) Multiply coefficients: $7.2 \times 1.5 = 10.8 = 1.08 \times 10^1$. Add exponents: $10^{5+3} = 10^8$. Combine: $1.08 \times 10^1 \times 10^8 = 1.08 \times 10^9$.
- 13) **Choice C is correct.** (8.EE.B.5) Proportional: $y = 15x$. For $x = 2.5$: $y = 15(2.5) = 37.5 \text{ MB}$.
- 14) **Choice C is correct.** (8.EE.C.8a) Verify $(2, 3)$: $y = 2 + 1 = 3 \checkmark$ and $y = -2 + 5 = 3 \checkmark$. The marked intersection point is $(2, 3)$.
- 15) **Choice A is correct.** (8.EE.C.8b) Add 6: $2x \leq 16$. Divide by 2: $x \leq 8$.
- 16) **Choice A is correct.** (8.EE.C.7) The GCF of $6x$ and 9 is 3. Factor: $6x + 9 = 3(2x + 3)$.
- 17) **Choice C is correct.** (8.F.A.1) Non-vertical straight lines pass the vertical line test and are functions. Every vertical line intersects the graph at most once.
- 18) **The correct answer is A, C.** (8.NS.A.1) Statement A is true because rational numbers are closed under addition. Statement C is true because any terminating decimal, such as $0.75 = \frac{3}{4}$, is rational. Statement B is false because two irrational numbers can multiply to a rational number, for example $\sqrt{2} \times \sqrt{8} = 4$. Statement D is false because integers are rational. Statement E is false because perfect squares have rational square roots, not irrational ones.
- 19) **Choice B is correct.** (8.F.A.3) The differences between consecutive y -values are $1 - 0 = 1$, $4 - 1 = 3$, $9 - 4 = 5$, which are not constant, indicating a nonlinear (quadratic) function.
- 20) **Choice B is correct.** (8.F.B.4) Slope: $\frac{16-12}{2-0} = \frac{4}{2} = 2 \text{ cm/week}$. (Or: from week 0 to 4, height goes from 12 to 20, a change of 8 cm in 4 weeks $= 2 \text{ cm/week}$.)
- 21) **Choice A is correct.** (8.F.B.5) A y -intercept occurs where $x = 0$, giving point $(0, -3)$. An x -intercept occurs where $y = 0$, giving point $(2, 0)$.
- 22) **Choice D is correct.** (8.G.A.2) Rotation is a rigid motion that preserves lengths. If two segments are congruent before rotation, they remain congruent after rotation. Both still have their original lengths.
- 23) **Choice A is correct.** (8.G.A.3) Under 90° counterclockwise rotation, $(x, y) \rightarrow (-y, x)$. So $(2, 1) \rightarrow (-1, 2)$.
- 24) **Choice A is correct.** (8.G.A.5) Exterior angle $=$ sum of remote interior angles: $117 = 68 + x$, so $x = 49^\circ$.
- 25) **Choice A is correct.** (8.G.B.6, 8.G.B.7) Using $(\sqrt{8})^2 + (\sqrt{8})^2 = c^2$ gives $8 + 8 = 16$, so $c = \sqrt{16} = 4$.
- 26) **Choice C is correct.** (8.G.C.9) Let original height be h . After doubling, $V = \frac{1}{3} \times 18 \times 2h = 240 \Rightarrow 12h = 240 \Rightarrow h = 20 \text{ cm}$.
- 27) **The correct answer is 9.4.** (8.NS.A.2) The side length is $\sqrt{88}$. Since $9^2 = 81$ and $10^2 = 100$, and 88 is closer to 81, we estimate $\sqrt{88} \approx 9.38 \approx 9.4$.



Hi, Grade 8 Math Star!

◇ You finished this practice set with real effort. Grade 8 math asks you to connect ideas, explain your thinking, and stay steady through multi-step problems. ◇

★ **Remember this:** Every page you completed helped build stronger habits: reading carefully, choosing a method, showing work, and checking whether the answer makes sense. You practiced across 3 full Grade 8 practice tests, and that repeated effort matters. ★

What You Built

- **Focus:** You stayed with challenging questions.
- **Accuracy:** You learned to slow down when details matter.
- **Reasoning:** You practiced explaining why a method works.
- **Readiness:** You are more prepared than when you started.

Grade 8 test-day tip: Before test day, review the questions that made you pause. Those are the best teachers.

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

Jay Daie

Your Grade 8 Math Friend

PRACTICE TODAY, ACHIEVE TOMORROW!

GRADE
8

Give your child the edge they need with **3 full-length** Grade 8 Math practice tests that reflect real test formats and cover all key math standards. Perfect for building skills, boosting confidence, and preparing for 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.



Build Skills & Boost Confidence

Strengthen understanding and feel prepared for test day.

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!



2 Extra Online Practice Tests Included!

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

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PRACTICE. PREPARE. SUCCEED.



Testinar

More Practice. More Confidence.
Better **Results**.