

10 Vermont VTCAP

GRADE
7
MATH

PRACTICE TESTS

Standards Aligned Problem
Solving For Comprehensive
Assessment Programs



10 PRINTED TESTS

Realistic practice to build
confidence and mastery



2 ONLINE TESTS

Extra practice for
continued success



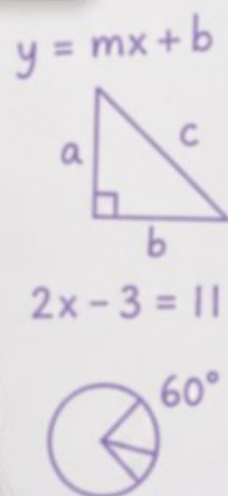
DETAILED ANSWER EXPLANATIONS

Learn with step-by-step
solutions



FOCUSED & EFFECTIVE

Target key math skills
with purposeful practice



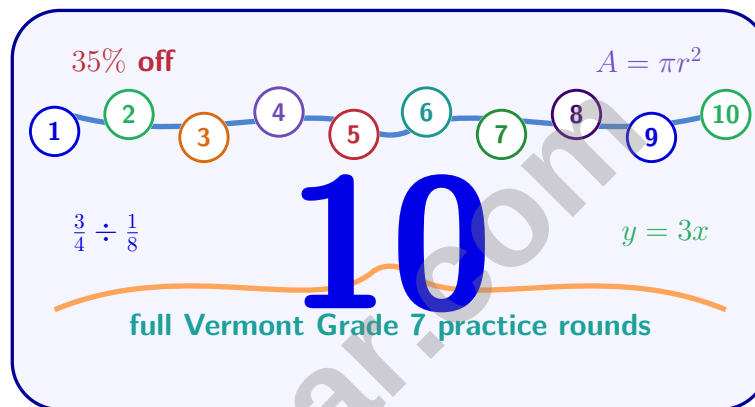
10 PRINTED TESTS
+2 ONLINE TESTS

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

PRACTICE ★ REVIEW ★ SUCCEED

10 Vermont VTCAP Grade 7 Math Practice Tests

Vermont Grade 7 VTCAP Practice for calm, careful practice with ratios, percent models, equations, geometry, data, and probability



Ten complete 40-question Grade 7 VTCAP practice rounds with proportional relationships, percents, rational numbers, expressions, equations, geometry, statistics, probability, answer keys, and clear explanations for every item.

Jay Daie and Reza Nazari



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Welcome, Vermont Grade 7 Problem Solver!

Ten focused rounds for sharper Vermont VTCAP math thinking

This book gives you ten full Grade 7 VTCAP math practice tests. Each round is built to help you notice structure, compare quantities, use proportional reasoning, handle rational numbers, 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 ten-session plan for confident Grade 7 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 a proportion, equation, diagram, number line, 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?

Ten Vermont VTCAP tests, 400 questions, and a complete review path

Part	What You Will Practice
Tests 1–3	Proportional relationships, unit rates, percents, rational-number operations, and careful reading.
Tests 4–6	Expressions, equations, inequalities, scale drawings, geometry, and multi-step problem solving.
Tests 7–9	Statistics, probability, mixed review, stamina, and choosing efficient strategies.
Test 10	A final Vermont round to show growth across the whole book.
Answer Pages	Compact keys and explanations that show why each answer works.

The tests are mixed on purpose. Grade 7 success means recognizing which idea is being tested even when the next question changes format.



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1) What is $2\frac{1}{2} \times 4$?

☐ A. 8

☐ C. 10

☐ B. 9

☐ D. 12

2) Simplify: $k^8 \cdot k^0 \cdot k^2$

☐ A. k^{10}

☐ C. k^{16}

☐ B. k^1

☐ D. k^0

3) Rewrite $6x + 9y$ in factored form (greatest common factor).

☐ A. $3(2x + 3y)$

☐ C. $3x(2 + 3y)$

☐ B. $6(x + 1.5y)$

☐ D. $(6 + 9)(x + y)$

4) A researcher runs two independent simulations of the same event. Simulation 1 uses 100 trials and estimates probability 0.48. Simulation 2 uses 500 trials and estimates probability 0.52. Which simulation is likely to be a more reliable estimate of the true probability?

☐ A. Simulation 1, because it has fewer trials

☐ C. Simulation 2, because it has more trials

☐ B. Simulation 1, because the estimate is closer to 0.50

☐ D. Both are equally reliable

5) A histogram shows the number of goals scored by soccer teams in a season: 10–20 goals (4 teams), 20–30 goals (6 teams), 30–40 goals (7 teams), 40–50 goals (3 teams). Which interval has the highest frequency?

☐ A. 10–20 goals

☐ C. 30–40 goals

☐ B. 20–30 goals

☐ D. 40–50 goals



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- 6) Two spinners are spun. Spinner 1 has sections A, B, C (equally likely). Spinner 2 has sections 1, 2 (equally likely). What is the probability of landing on B and 1?

☐ A. $\frac{1}{6}$
☐ B. $\frac{1}{5}$

☐ C. $\frac{1}{3}$
☐ D. $\frac{1}{2}$

- 7) A container holds 25 beads: 10 red, 8 blue, and 7 green. A bead is selected at random. What is the probability of selecting a blue bead?

☐ A. $\frac{8}{25}$
☐ B. $\frac{8}{17}$

☐ C. $\frac{10}{25}$
☐ D. $\frac{7}{25}$

- 8) If a circle has a diameter of 26 meters, what is the length of its radius?

- 9) A merry-go-round has radius 5 meters. A child rides on it and goes around 4 complete times. How far does the child travel? Use $\pi \approx 3.14$. Round to the nearest tenth.

- 10) Which of the following describes mutually exclusive events?

☐ A. Rolling a 3 AND rolling an even number on one die roll
☐ B. Spinning red AND spinning blue on one spinner

☐ C. Drawing a heart AND drawing a face card
☐ D. Flipping heads AND flipping tails on one coin flip



- 11) A weather report analyzed 365 days of data. It rained on 78 days. What is the experimental probability that it will rain on any given day, based on this data?
- ☐ A. 0.17 ☐ C. 0.31
☐ B. 0.21 ☐ D. 0.78
- 12) A scout estimated that a hiking trail is 7.5 miles long, but the actual length is 8.25 miles. What is the percent error?
- ☐ A. 90.9% ☐ C. 0.75%
☐ B. 10% ☐ D. 9.1%
- 13) Expand: $-6(2 - 3p)$
- ☐ A. $-12 + 18p$ ☐ C. $12 + 18p$
☐ B. $-12 - 18p$ ☐ D. $-12 - 3p$
- 14) A principal amount earns \$200 in interest at 8% annual rate over 5 years. What was the original principal?
- ☐ A. \$400 ☐ C. \$600
☐ B. \$800 ☐ D. \$500

Error Analysis

A map has scale 1 inch : 5 miles.

Distance on map: 2 inches.

Student answer: Scale factor is $\frac{1}{5}$.

Actual distance: $\frac{2}{5} = 0.4$ miles.

15)

What is the student's error?

- ☐ A. Correct calculation. ☐ C. Divided instead of multiplying.
☐ B. Flipped the scale ratio (used 5 : 1 instead of 1 : 5). ☐ D. Forgot to convert units.



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- 1) A spinner is divided into 8 equal sections. 2 sections are labeled “Win”, 3 are labeled “Lose”, and 3 are labeled “Try Again”. What is the probability of spinning “Win”?

☐ A. $\frac{1}{8}$
☐ B. $\frac{1}{4}$

☐ C. $\frac{3}{8}$
☐ D. $\frac{1}{2}$

- 2) A data set has values: 12, 15, 15, 18, 21, 23, 24, 28. Which is the correct stem-and-leaf plot?

☐ A. Stem 1: 2, 5, 5, 8; Stem 2: 1, 3, 4, 8 ☐ C. Stem 1: 2, 5, 5, 8; Stem 2: 3, 4, 8, 1
☐ B. Stem 1: 1, 2, 5, 5; Stem 2: 1, 3, 4, 8 ☐ D. Stem 1: 1, 2, 3, 4; Stem 2: 1, 5, 5, 8

- 3) An item is on sale for \$48 after a 20% discount. What was the original price?



- 4) A rectangular prism has dimensions 2.5 m, 4 m, and 8 m. What is its volume?

☐ A. 14.5 m^3
☐ B. 80 m^3

☐ C. 100 m^3
☐ D. 20 m^3

- 5) Which event has a probability of 1 (certain)?

☐ A. Rolling an even number on a standard die ☐ C. Picking a red card from a standard deck
☐ B. Flipping a coin and getting heads ☐ D. The sun rising tomorrow



6) Identify which term is not a like term with $3x$.

☐ A. $7x$

☐ C. x

☐ B. $-2x$

☐ D. $3x^2$

7) What is the correct factorization of $-6m + 18$?

☐ A. $6(-m + 3)$

☐ C. $-6(m + 3)$

☐ B. $-6(m - 3)$

☐ D. $6(m - 3)$

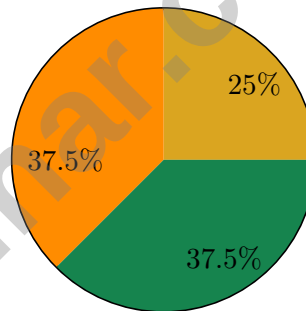
8) A rectangular prism has length 12 in, width 6 in, and height 5 in. Find the surface area.

☐ A. 360 in^2

☐ C. 258 in^2

☐ B. 324 in^2

☐ D. 180 in^2



9)

The circle graph shows student class enrollment distribution. Gold is Algebra (25%), orange is Geometry (37.5%), and coral is Statistics (37.5%). If 800 students are surveyed, how many are in Geometry?

☐ A. 200

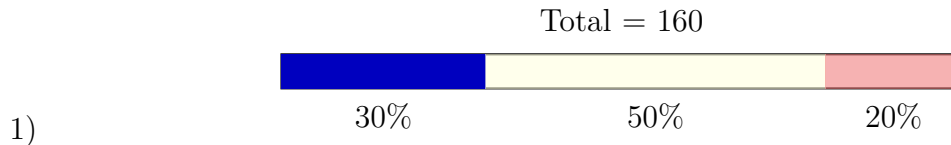
☐ C. 300

☐ B. 250

☐ D. 400

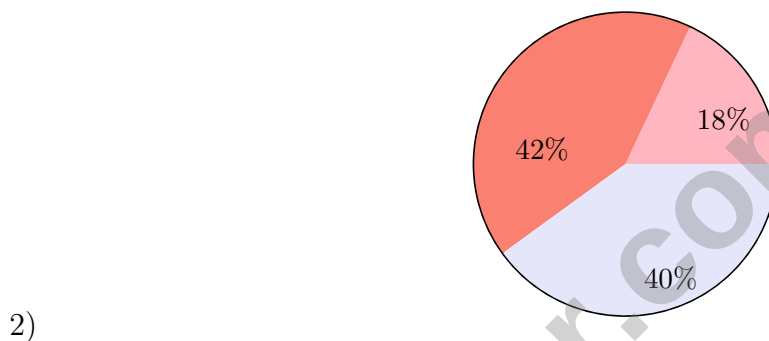


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The bar shows the distribution of 160 items. How many items are in the 50% section?

- ☐ A. 48 ☐ C. 80
☐ B. 64 ☐ D. 96



The circle graph displays student participation in after-school activities. Light pink is sports (18%), salmon is clubs (42%), and lavender is arts (40%). If 600 students attend the school, how many participate in clubs?

- ☐ A. 108 ☐ C. 240
☐ B. 180 ☐ D. 252

3) A survey question asks: “In your opinion, is the new school lunch program much better than the old one?” This question has a problem because:

- ☐ A. It uses a loaded word (“much better”)
☐ B. It is too long
☐ C. It requires too much opinion
☐ D. It is too vague



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4)

Outcome	Red	Blue	Green
Probability	0.35	0.25	?

A probability model is shown. Find the probability of Green.

5) Simplify: $(3f - 9) - (2f - 5)$

☐ A. $f - 4$

☐ B. $f + 4$

☐ C. $5f - 4$

☐ D. $f - 14$

Simplify the expression below:

$$\frac{(j^3)^2}{j^5}$$

Which law applies FIRST?

6)

Power Rule

Product Rule

Simplify $\frac{(j^3)^2}{j^5}$:

☐ A. j^1 or j

☐ B. j^7

☐ C. j^{11}

☐ D. j^{30}

7) A tutoring center charges an enrollment fee of \$30 and \$45 per session. Write an equation that models the total cost T for s sessions.

☐ A. $T = (30 + 45)s$

☐ B. $T = 30s + 45$

☐ C. $T = 30 + 45s$

☐ D. $T = 45 + 30s$



Vermont VTCAP Grade 7 Practice Test Answer Keys**How to use this section with a Grade 7 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.** (7.NS.2) $2\frac{1}{2} = \frac{5}{2}$. So $\frac{5}{2} \times 4 = \frac{20}{2} = 10$.
- 2) **Choice A is correct.** (7.EE.1-7.EE.2) Apply zero exponent rule ($k^0 = 1$) and product rule: $k^8 \cdot 1 \cdot k^2 = k^{8+2} = k^{10}$.
- 3) **Choice A is correct.** (7.EE.1-7.EE.2) The GCF of the coefficients 6 and 9 is 3. Factoring: $6x + 9y = 3(2x + 3y)$. This equivalent form uses the greatest common factor to show the structure: three groups of $(2x + 3y)$.
- 4) **Choice C is correct.** (7.SP.5-7.SP.8) Larger sample sizes reduce the effect of random variation and produce more stable estimates. The 500-trial simulation is more reliable.
- 5) **Choice C is correct.** (7.SP.1-7.SP.4) The 30–40 interval has a frequency of 7, which is higher than 4, 6, or 3.
- 6) **Choice A is correct.** (7.SP.5-7.SP.8) Total outcomes: $3 \times 2 = 6$. Favorable outcome: B1 = 1 outcome. Probability: $\frac{1}{6}$.
- 7) **Choice A is correct.** (7.SP.5-7.SP.8) Blue beads: 8 out of 25. $P(\text{blue}) = \frac{8}{25}$.
- 8) **The correct answer is 13.** (7.G.4-7.G.6) Use $r = \frac{d}{2}$: $r = \frac{26}{2} = 13$ meters.
- 9) **The correct answer is 125.6.** (7.G.4-7.G.6) Circumference = $2\pi r = 2 \times 3.14 \times 5 = 31.4$ m. Distance = $4 \times 31.4 = 125.6$ m.
- 10) **Choice D is correct.** (7.SP.5-7.SP.8) Mutually exclusive events cannot happen at the same time. A coin cannot show both heads and tails on one flip.
- 11) **Choice B is correct.** (7.SP.6) Relative frequency of rainy days: $\frac{78}{365} \approx 0.214 \approx 0.21$. This experimental probability predicts future rain likelihood.
- 12) **Choice D is correct.** (7.RP.3) Percent error = $\frac{|7.5 - 8.25|}{8.25} \times 100\% = \frac{0.75}{8.25} \times 100\% \approx 9.1\%$.
- 13) **Choice A is correct.** (7.EE.1-7.EE.2) Distribute -6 : $-6(2) - 6(-3p) = -12 + 18p$.
- 14) **Choice D is correct.** (7.RP.3) $200 = P \times 0.08 \times 5 \Rightarrow 200 = 0.4P \Rightarrow P = \500 .
- 15) **Choice C is correct.** (7.RP.1-7.RP.3) Correct answer: $2 \times 5 = 10$ miles. Student divided ($2 \div 5 = 0.4$) instead of multiplied.
- 16) **Choice D is correct.** (7.RP.3) Markup amount = $18 - 12 = \$6$. Percent = $\frac{6}{12} \times 100 = 50\%$.
- 17) **Choice D is correct.** (7.NS.1b) New altitude = $35000 + (-2000) = 33000$ feet. The plane's altitude decreased by 2000 feet.
- 18) **The correct answer is 188.4.** (7.G.4-7.G.6) Radius is half the diameter: $r = 3$ cm. Lateral area = $2\pi rh \approx 2 \times 3.14 \times 3 \times 10 = 188.4$ cm².
- 19) **The correct answer is A,D.** (7.G.4-7.G.6) Choice A gives the correct formula. Choice D is verified: $3.14 \times 5^2 = 78.5$ cm². B confuses formula with circumference. C forgets that area scales with the square of the radius. E mistakes semicircle (half) for one-third.
- 20) **Choice A is correct.** (7.NS.1-7.NS.3) Rewrite each subtraction as adding the opposite. A: $-2 - 5 = -2 + (-5) = -7$ ✓. B: $-1 - 5 = -6$. C: $-9 + 1 = -8$. D: $3 - (-4) = 3 + 4 = 7$. Only A equals -7 .
- 21) **Choice A is correct.** (7.EE.1) x terms: $3x + 5x - 2x = (3 + 5 - 2)x = 6x$. y terms: $4y + y - 3y = (4 + 1 - 3)y = 2y$. Result: $6x + 2y$.
- 22) **Choice A is correct.** (7.EE.1-7.EE.2) GCF of 4 and 8 is 4. Factor: $4x + 8y = 4(x + 2y)$.
- 23) **Choice B is correct.** (7.SP.1-7.SP.4) 40% of 80 = $0.40 \times 80 = 32$ households.
- 24) **Choice C is correct.** (7.RP.3) 22% of 400 is $0.22 \times 400 = 88$ books.
- 25) **Choice A is correct.** (7.EE.4b) Add 3: $1.5x \leq 7.5$. Divide by 1.5: $x \leq 5$.
- 26) **Choice B is correct.** (7.NS.1-7.NS.3) Common denominator is 12: $\frac{9}{12} - \frac{2}{12} = \frac{7}{12}$.
- 27) **Choice B is correct.** (7.NS.1-7.NS.3) $\frac{7}{10} \div \frac{7}{15} = \frac{7}{10} \times \frac{15}{7} = \frac{105}{70} = \frac{3}{2}$.
- 28) **Choice B is correct.** (7.NS.2d) Divide $1 \div 6 = 0.1666\ldots = 0.1\overline{6}$. Since $6 = 2 \times 3$, the factor 3 makes it repeat.
- 29) **Choice C is correct.** (7.NS.1-7.NS.3) Weight loss: $\frac{1}{6} \times 180 = 30$ pounds.
- 30) **Choice B is correct.** (7.NS.1-7.NS.3) Time = distance $\div$ rate. The diver descends 18 meters at 1.5 m/s: $18 \div 1.5 = 12$ seconds.



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Hi, Math Hero!

◇ This full-length book gave you ten complete Grade 7 practice tests, so you had repeated chances to build accuracy, pacing, and confidence. You showed up for Grade 7 practice again and again. That is what real growth looks like: steady effort, honest review, and a willingness to try. ◇

★ **Remember this:** A math hero is not someone who never misses a question. A math hero learns from the miss and comes back stronger. ★

Hero Habits

- **Courage:** You try problems that are not automatic.
- **Honesty:** You review what needs work.
- **Patience:** You let skills grow over time.
- **Pride:** You recognize the effort you gave.

Grade 7 test-day tip: Save one solved problem you are proud of. Looking back at progress helps motivation stay strong.

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

Jay Daie

Your Math Hero Guide

PRACTICE TODAY. SUCCEED TOMORROW!

This book includes 10 full-length Math practice tests and 2 extra online tests to help Grade 7 students build confidence, strengthen skills, and excel on standardized assessments.

Each practice test is carefully crafted to reflect the latest standards and includes a variety of question types, realistic test conditions, and detailed answer explanations.

Perfect for classroom use, homework, test preparation, and extra practice at home.

THIS BOOK INCLUDES:

10 Full-Length Printed Tests

2 Online Practice Tests

 Detailed Answer Explanations



MORE PRACTICE. GREATER RESULTS.

Give your child the tools to build strong math skills, confidence, and a positive attitude toward learning.

WHAT YOU'LL GAIN



Stronger Math Skills

Build a solid foundation through targeted practice and review.



Better Problem Solving

Develop logical thinking and effective solution strategies.



Deeper Understanding

Reinforce key concepts with clear explanations and meaningful practice.



Test Confidence

Familiarize with test formats and improve accuracy and speed.



Achieve Success

Build confidence and perform your best on test day.

TOPICS COVERED

- ✓ Ratios & Proportions
- ✓ The Number System
- ✓ Expressions & Equations
- ✓ Geometry
- ✓ Fractions & Decimals
- ✓ Percents
- ✓ Statistics & Probability
- ✓ Data Analysis
- ✓ Measurement & Conversions
- ✓ And More!



2 EXTRA ONLINE TESTS

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



2 EXTRA ONLINE TEST ACCESS CODE IS INSIDE THE BOOK!

Don't lose it—your extra practice and success start here!



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SUCCEED
BRIGHTLY

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