

7 Virginia SOL Grade 7 Math Practice Tests

Comprehensive Test Prep with Detailed Answers

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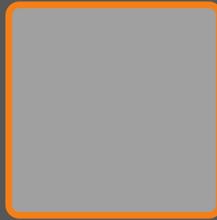
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THE FORGE

7 Practice Tests

 Grade 7 Math — Forged in Practice 

Welcome to *The Forge*.

Seven tests. Seven chances to hammer your skills into something unbreakable. Each test is a piece of raw material — and you are the blacksmith.

 *Heat 1–2: Warm the metal — learn the form*

 *Heat 3–5: Shape with precision — build power*

 *Heat 6–7: Temper and finish — prove your craft*

Great skill isn't found. It's forged.

“ A sword isn't made with one strike. Seven rounds of hammering — that's how you forge something strong. ”



The Blueprint

Your 3-heat forging plan for Grade 7 mastery

What's in The Forge

- **7 Full-Length Practice Tests** — every test spans all 9 Grade 7 domains: proportional reasoning, percents, rational numbers, algebraic expressions, equations, geometry, measurement, statistics, and probability.
- **Complete Answer Explanations** — learn the craft behind every solution, not just the result.
- **Forge Record** — track your progress heat by heat and see your skills harden into mastery.

Heat I: Warm the Metal (Tests 1–2)

No timer. No pressure. Feel the material — discover the question types, learn the format, and identify which topics are solid and which need shaping.

Heat II: Shape with Precision (Tests 3–5)

Add a timer (60–75 min). Show every step of your work. After each test, study the problems you missed and practice those topics before the next heat.

Heat III: Temper & Finish (Tests 6–7)

Full test conditions: timed, quiet, independent. These final two heats prove your craft. Compare your scores with Heat I — see how far you've come.

Materials in Every Test

- **Multiple Choice** — select the best answer
- **Multi-Select** — choose ALL that apply
- **Short Answer** — show your work
- **Open Response** — explain your reasoning

Master Techniques

The techniques every skilled crafter needs at the anvil

The S.T.R.I.K.E. Method

- S** **Scan** Read the whole problem. What is given? What is asked?
- T** **Tag** Underline key values. Circle the operation clue words.
- R** **Reason** Choose a strategy: proportion, equation, diagram, or estimation.
- I** **Implement** Solve step by step. Write every calculation. Label units.
- K** **Know** Check: does the answer make sense in context?
- E** **Evaluate** Re-read the question. Did you answer what was actually asked?

Forging Techniques

Technique 1: Convert between fractions, decimals, and percents freely. Many Grade 7 problems become easier in a different form.

Technique 2: When solving proportions, cross-multiply carefully. Keep track of which quantity is in the numerator and which is in the denominator.

Technique 3: For integer operations, use the number line mentally. Subtracting a negative? That's adding. Don't let sign rules trip you up.

Technique 4: On geometry questions, draw a diagram if one isn't given. Label all known measurements before computing.

Technique 5: Estimation is your ally. Before computing an exact answer, estimate. If your answer is far from the estimate, recheck your work.

Technique 6: Never leave a blank. On constructed response, even writing the equation you'd use can earn partial credit.

 **Night Before Practice:** Sleep 8+ hours. Eat a solid meal. Gather your tools (pencils, eraser, scratch paper). Tell yourself: "Every strike makes me stronger."



The Forgemaster says: "The greatest crafters don't avoid the hardest pieces — they lean into them. Review every mistake. That's where the real tempering happens."

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Math Reference Sheet

You may use this page during your practice tests!

Symbol	Name	What It Means
$()$	Parentheses	Do this part first. $(3 + 4) \times 2 = 14$
10^3	Exponent	Multiply the base by itself that many times. $10^3 = 1,000$
$\frac{a}{b}$	Fraction	a parts out of b equal parts; also means $a \div b$.
$\frac{7}{3}$	Improper Fraction	Numerator \geq denominator. $\frac{7}{3} = 2\frac{1}{3}$
0.45	Decimal	A number with a decimal point. $0.45 = \frac{45}{100}$
$> < =$	Comparison	Greater than, less than, equal to. $0.5 > 0.35$
$(3,5)$	Ordered Pair	A point on the coordinate plane: (x, y) .

Key Formulas

- **Volume of a rectangular prism:**

$$V = l \times w \times h$$

- **Order of operations:**

Parentheses \rightarrow Exponents \rightarrow Multiply/Divide

\rightarrow Add/Subtract

- **Powers of 10:**

$$10^1 = 10 \quad 10^2 = 100$$

$$10^3 = 1,000 \quad 10^4 = 10,000$$

- **Fraction as division:**

$$\frac{a}{b} = a \div b$$

Place Value Chart

Millions	1,000,000
Hundred-Thousands	100,000
Ten-Thousands	10,000
Thousands	1,000
Hundreds	100
Tens	10
Ones	1

Decimals

Tenths	0.1
Hundredths	0.01
Thousandths	0.001

Each place is $10\times$ the place to its right, and $\frac{1}{10}$ of the place to its left.

Key Math Vocabulary

- **Sum** — the result of addition
- **Difference** — the result of subtraction
- **Product** — the result of multiplication
- **Quotient** — the result of division
- **Remainder** — what's left over after dividing
- **Factor** — a number you multiply
- **Expression** — numbers and operations without =
- **Equation** — a math sentence with =
- **Numerator** — the top number of a fraction
- **Denominator** — the bottom number of a fraction
- **Mixed number** — a whole number + a fraction
- **Equivalent fractions** — fractions with equal value
- **Decimal** — a number written with a decimal point
- **Volume** — the space inside a 3D shape
- **Coordinate plane** — a grid with x and y axes
- **Ordered pair** — (x, y) location on the plane

Word Problem Clue Words

- **Add (+)**: total, altogether, combined, sum, increase, more than
- **Subtract (-)**: difference, how many more, fewer, remain, decrease, left
- **Multiply (\times)**: each, every, groups of, times, product, per, of (with fractions)
- **Divide (\div)**: share equally, split, each group, how many groups, quotient, per



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PREVIEW

PRACTICE TEST

1

Practice Test 1

 30 Questions

Before You Start

- ✓ *Read each question carefully before choosing your answer.*
- ✓ *Show your work on scratch paper when you need to.*
- ✓ *Skip hard questions and come back to them later.*
- ✓ *Check your answers when you're done.*
- ✓ *Take your time — there's no rush!*

★ *You've Got This!* ★

Do your best and show what you know!



1. A proportional relationship has the equation $y = \frac{2}{5}x$. What is y when $x = 20$?

(A) 4

(B) 8

(C) 10

(D) 50

2. What is 8% of 250?

(A) 2

(B) 16

(C) 20

(D) 32

3. In a survey, 51 out of 300 people chose vanilla ice cream. What percent chose vanilla?

Your Answer:

4. A population grew from 5,000 to 5,750. What is the percent increase?

(A) 12%

(B) 13%

(C) 15%

(D) 17.5%

5. A chemist expected to collect 75 mL of solution but collected 80 mL. What is the percent error (rounded to the nearest tenth)?

(A) 5%

(B) 6.3%

(C) 6.7%

(D) 7.5%

6. The temperature is -4°C at dawn. By noon it rises 10°C . What is the noon temperature?

(A) -14°C

(B) 14°C

(C) -6°C

(D) 6°C



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7. Find the distance between -11 and -3 on a number line.

Your Answer:

8. What is $-\frac{3}{5} + \frac{3}{5}$?

(A) $\frac{6}{5}$

(B) $-\frac{6}{5}$

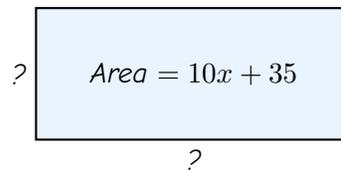
(C) 0

(D) $\frac{6}{10}$

9. Expand $-6(2m - 5)$.

Your Answer:

10. The rectangle below has the given area. Which pair of dimensions is correct?



(A) Width = 5, Length = $2x + 7$

(B) Width = 10, Length = $x + 35$

(C) Width = 5, Length = $2x + 35$

(D) Width = 2, Length = $5x + 35$



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11. The table shows input and output values for a function. What is the rule?

Input (x)	Output (y)
2	2.5
4	3.5
6	4.5
10	6.5

(A) $y = 0.5x + 1.5$

(B) $y = x - 0.5$

(C) $y = 0.25x + 2$

(D) $y = 2x - 1.5$

12. Which inequality represents "at most 15"?

(A) $x > 15$

(B) $x < 15$

(C) $x \geq 15$

(D) $x \leq 15$

13. Solve $5 - x > 8$ and describe the graph.

(A) Open circle at 3, shade right

(B) Open circle at -3 , shade left

(C) Closed circle at -3 , shade left

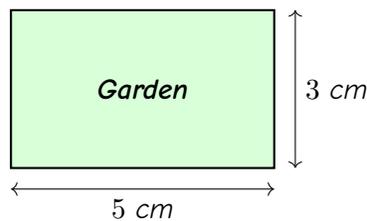
(D) Open circle at -3 , shade right



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14. The scale drawing below shows a rectangular garden with scale $1 \text{ cm} = 3 \text{ m}$. Which statement is correct about the actual garden?



- (A) The actual garden has an area of 15 m^2 (B) The actual garden has a perimeter of 48 m
- (C) The actual garden has an area of 135 m^2 (D) The actual garden has a perimeter of 16 m

15. A model uses scale $1 : 100$. You need to redraw it at scale $1 : 50$. A wall that is 4 cm on the original model becomes how long?

- (A) 2 cm (B) 4 cm
- (C) 8 cm (D) 200 cm

16. You slice a rectangular pyramid with a cut parallel to the base, halfway up. What shape is the cross-section?

- (A) A triangle (B) A smaller rectangle
- (C) A circle (D) A pentagon

17. Two angles are complementary. One angle is 27° . What is the other angle?

- (A) 53° (B) 63°
- (C) 73° (D) 153°



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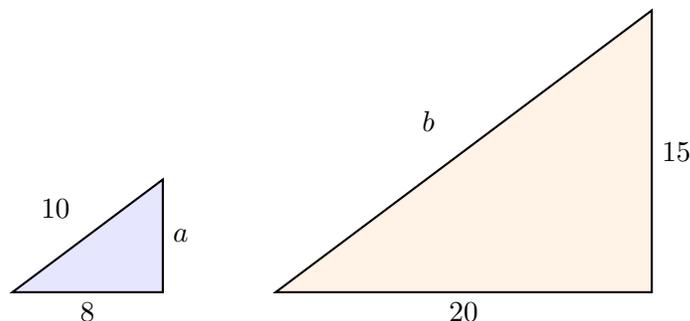
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18. A triangle has vertices $A(2, 1)$, $B(6, 1)$, and $C(6, 4)$. Reflect the triangle over the y -axis. List the new vertices.

Your Answer:

19. The two triangles below are similar. Find the missing side lengths a and b .



Your Answer:

20. A square has sides of 10 m. A quarter circle with radius 10 m is removed from one corner. What is the area of the remaining figure? Use $\pi \approx 3.14$.

- (A) 21.5 m^2 (B) 50 m^2
(C) 78.5 m^2 (D) 100 m^2

21. A rectangular box is 10 in by 6 in by 4 in. What is the total surface area?

- (A) 120 in^2 (B) 240 in^2
(C) 248 in^2 (D) 148 in^2



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22. A rectangular prism has a volume of 360 cm^3 . Its length is 12 cm and its height is 5 cm. What is its width?

Your Answer:

23. Find the surface area of a cylinder with radius 7 cm and height 10 cm. Use $\pi \approx \frac{22}{7}$.

Your Answer:

24. A random sample of 80 out of 2,000 students found that 20 students ride the bus. Predict how many students in the school ride the bus.

Your Answer:

25. Group X has a median of 50 and a range of 10. Group Y has a median of 50 and a range of 30. Which statement is true?

- (A) Group X has more data values (B) Group Y has a higher center
(C) Group Y is more spread out than Group X (D) The groups are identical

26. Data set A: 10, 12, 14, 16, 18. What is the mean?

- (A) 12 (B) 14
(C) 16 (D) 70



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★ End of Practice Test 1 ★

Great job finishing the test!

My Score

I got _____ out of 30 questions right.

*Check your answers in the **Answer Key** at the back of the book.*

 *Review any questions you missed. That's how we learn!*

THANK YOU

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The complete book includes:

- ✓ *All chapters and topics*
- ✓ *Hundreds of practice problems*
- ✓ *Complete answer key with explanations*
- ✓ *Colorful visuals and step-by-step examples*
- ✓ *Reference sheets and progress trackers*

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