

# 7 Virginia SOL Grade 8 Math Practice Tests

*Comprehensive Test Prep with Detailed Answers*

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# 7 Practice Tests

## Welcome!

*This book contains **7 full-length practice tests** designed to give you thorough preparation for your Grade 8 math assessment. Each test covers all six major topics:*

📖 Irrational Numbers    📖 Powers & Scientific Notation

📖 Linear Equations    📖 Functions

📖 Geometry    📖 Data & Relationships

*Seven tests give you the repetition you need to master every topic. With each test, you'll get faster, more accurate, and more confident.*

*Repetition builds mastery. Mastery builds confidence.*

“Seven tests means seven chances to improve. Focus on one topic at a time and you'll see real results!”



# 📖 How to Use This Book 📖

*Make the most of 7 practice tests*

## What's Inside

- **7 Full-Length Practice Tests** — each covers all 6 chapters of Grade 8 math: irrational numbers, exponents & scientific notation, linear equations, functions, geometry, and data analysis.
- **Detailed Answer Explanations** — every question includes a step-by-step solution so you can understand the reasoning.
- **Formula Reference Sheet** — essential Grade 8 formulas and key concepts for quick review before each test.
- **Test Tracker** — log your scores across all 7 tests and monitor your improvement over time.

## Your 7-Test Battle Plan

### ★ PHASE 1: DISCOVER (Tests 1–2)

Untimed. Find your strengths and weaknesses. Review every answer explanation.

### ★★ PHASE 2: BUILD (Tests 3–4)

Soft timer (70 min). Start practicing pacing and time management.

### ★★★ PHASE 3: SHARPEN (Tests 5–6)

Timed, strict. Speed + accuracy together. Show complete solutions.

### PHASE 4: PROVE IT (Test 7)

Full test conditions: timed, quiet, no notes. Compare with Test 1.

*Tip: Space tests 4–5 days apart. Use the days between to study the topics you missed.*

 **Types of Questions**

 **Multiple Choice:** Four answer options — only one is correct. Eliminate clearly wrong options to improve your odds.

 **Short Answer & Constructed Response:** Show all your work: equations, substitutions, and simplifications. Even a partial solution can earn credit.

 **Graphing & Data:** Plot points, draw lines, interpret scatter plots. Use a ruler and label everything clearly.



**Tip:** With 7 tests, you have the depth to truly master every topic. Don't rush through them — quality review between tests is what drives real improvement.



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# 💡 Test-Taking Tips 💡

*A problem-solving checklist for every question*

## Your Problem-Solving Checklist

- ☐ *I read the entire problem and identified what is given and what is asked.*
- ☐ *I wrote the formula or equation before substituting any numbers.*
- ☐ *I solved step by step and showed every operation.*
- ☐ *I checked my answer by plugging it back in or estimating.*
- ☐ *I re-read the question to make sure I answered exactly what was asked.*
- ☐ *I labeled my answer with correct units or notation.*

## Common Mistakes in Grade 8 Math

-  **Irrational numbers:**  $\sqrt{2}$  is irrational — its decimal never terminates or repeats.
-  **Scientific notation:** When multiplying, add exponents; when dividing, subtract.
-  **Parallel lines:** Alternate interior angles are equal, not supplementary.
-  **Function notation:**  $f(3)$  means the output when input is 3, not  $f \times 3$ .
-  **Pythagorean theorem:**  $c$  is always the hypotenuse (longest side).

## Smart Strategies

- Answer the questions you're most confident about first
- Underline keywords: "simplify," "solve," "graph," "explain"
- For word problems, translate sentences into equations one phrase at a time
- Draw diagrams for geometry problems even if one isn't provided
- When stuck, skip and come back — fresh eyes often see the solution

 **After Each Test**

- Read the full explanation for every wrong answer
- Note the topic (not just the question number) so you know what to study
- Before the next test, review those topics until you understand them
- Log your results in the Test Tracker



“ Every wrong answer is a learning opportunity. After each test, go back and understand not just **what** the right answer is, but **why** your approach didn't work. ”



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# Grade 8 Formula Reference

Keep this page handy — you may use it during your practice tests!

## Exponent Rules

$$a^m \cdot a^n = a^{m+n} \quad (a^m)^n = a^{mn} \quad (ab)^n = a^n \cdot b^n$$
$$\frac{a^m}{a^n} = a^{m-n} \quad a^0 = 1 \quad (a \neq 0) \quad a^{-n} = \frac{1}{a^n}$$

## Lines & Linear Equations

**Slope:**  $m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{\text{rise}}{\text{run}}$

$m$  = slope     $b$  =  $y$ -intercept

**Slope-intercept:**  $y = mx + b$

Parallel lines: same slope

**Proportional:**  $y = mx$

Proportional: passes through origin

## Scientific Notation

$a \times 10^n$  where  $1 \leq |a| < 10$

**Multiply:** add exponents

**Divide:** subtract exponents

## Roots & Number Sense

**Perfect squares:** 1, 4, 9, 16, 25, 36, 49, 64, 81, 100, 121, 144

**Perfect cubes:** 1, 8, 27, 64, 125       $\sqrt{2} \approx 1.414$        $\sqrt{3} \approx 1.732$        $\pi \approx 3.14159$

## Pythagorean Theorem & Distance

$a^2 + b^2 = c^2$      $c$  = hypotenuse (longest side of a right triangle)    **Distance:**  $d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$

## Volume Formulas

**Cylinder**  $V = \pi r^2 h$       **Cone**  $V = \frac{1}{3} \pi r^2 h$       **Sphere**  $V = \frac{4}{3} \pi r^3$

### Angle Relationships

**Triangle angle sum:**  $180^\circ$

**Exterior angle** = sum of two remote interior angles

**Parallel lines + transversal:** Alternate interior angles are equal • Co-interior angles sum to  $180^\circ$

### Functions

Each input  $\rightarrow$  exactly one output    **Vertical line test:** if any vertical line hits graph more than once  $\Rightarrow$  not a function

**Linear:** constant rate of change ( $y = mx + b$ )

**Nonlinear:** rate of change varies

### Transformations

**Translation:** slide

**Reflection:** flip

**Rotation:** turn

**Dilation:** resize

Congruent = same shape & size

Similar = same shape, proportional size



**Tip:** Bookmark this page! Review it before each test so these formulas become second nature.



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PRACTICE TEST

1

## Practice Test 1

 10 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 number has a decimal expansion that goes on forever without ever repeating. What kind of number is it?

- (A) Integer                      (B) Rational  
(C) Irrational                  (D) Whole number

2. What is  $0.\overline{54}$  in simplest form?

- (A)  $\frac{54}{99}$                       (B)  $\frac{6}{11}$   
(C)  $\frac{54}{100}$                   (D)  $\frac{27}{50}$

3. Is  $\sqrt{11} + 1$  greater than or less than  $\pi + 1$ ? Explain.

Your Answer:

4. A jacket costs \$80. Sales tax is 7%. What is the total cost?

- (A) \$85.60                      (B) \$87.00  
(C) \$5.60                      (D) \$74.40

5. Simplify  $\left(\frac{3}{4}\right)^{-2}$ .

- (A)  $\frac{9}{16}$                       (B)  $\frac{-9}{16}$   
(C)  $\frac{16}{9}$                       (D)  $\frac{-6}{8}$



6. The diameter of a red blood cell is about 0.000007 meters. What is this in scientific notation?

(A)  $7 \times 10^{-5}$

(B)  $7 \times 10^{-6}$

(C)  $7 \times 10^6$

(D)  $70 \times 10^{-7}$

7. Add  $2.8 \times 10^5 + 7.2 \times 10^5$ . Write your answer in scientific notation.

Your Answer:

8. Runner A runs  $y = 6x$  (miles in  $x$  hours). Runner B runs 28 miles in 4 hours. Who is faster?

(A) Runner A

(B) Runner B

(C) They run at the same speed.

(D) Not enough information.

9. Solve  $4(x - 1) = 3(x + 2)$ .

Your Answer:



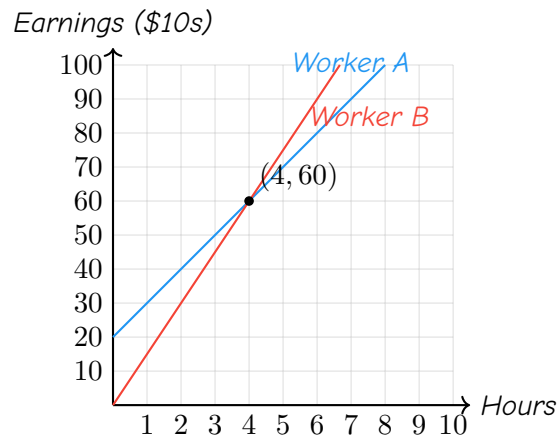
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10. The graph shows two lines representing the earnings of two workers. Worker A earns a fixed amount plus an hourly rate, and Worker B earns only an hourly rate.



After 4 hours, both workers have earned \$60. If Worker B works 6 hours, how much more does Worker B earn than Worker A?

- (A) \$5                                      (B) \$10
- (C) \$15                                      (D) \$20



## ★ End of Practice Test 1 ★

*Great job finishing the test!*

### My Score

*I got \_\_\_\_\_ out of 10 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!*

# *Answer Key & Explanations*



## Answer Key

First try each test on your own, then check your work here.

### Practice Test 1 — Answer Key

1 C

2 B

3 Greater than

4 A

5 C

6 B

7  $1 \times 10^6$ 

8 B

9  $x = 10$ 

10 B

### Time to Learn!

Review the explanations below, *especially for the questions you missed*.

Understanding why each answer is correct builds stronger problem-solving skills.

*Tip:* Circle any questions you got wrong, then read their explanation carefully.

### Practice Test 1 — Detailed Explanations

1 A decimal that goes on forever without repeating is the defining characteristic of an irrational number.

2  $99x = 54$ , so  $x = \frac{54}{99}$ . Dividing both by 9:  $\frac{54}{99} = \frac{6}{11}$ .



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3  $\sqrt{11} \approx 3.317 > 3.14 \approx \pi$ . Adding 1 to both sides preserves the inequality:  $\sqrt{11} + 1 \approx 4.317 > 4.14 \approx \pi + 1$ .

4  $\text{Tax} = 80 \times 0.07 = 5.60$ .  $\text{Total} = 80 + 5.60 = \$85.60$ .

5 A negative exponent flips the fraction:  $\left(\frac{3}{4}\right)^{-2} = \left(\frac{4}{3}\right)^2 = \frac{16}{9}$ .

6 Move the decimal 6 places right:  $0.000007 = 7 \times 10^{-6}$ .

7  $2.8 + 7.2 = 10$ , so  $10 \times 10^5 = 1 \times 10^6$ .

8 Runner A:  $k = 6$  mph. Runner B:  $k = \frac{28}{4} = 7$  mph. Since  $7 > 6$ , Runner B is faster.

9  $4x - 4 = 3x + 6$ . Subtract  $3x$ :  $x - 4 = 6$ . Add 4:  $x = 10$ .

10 Worker A:  $y = 10x + 20$ , so at 6 hrs: \$80. Worker B:  $y = 15x$ , so at 6 hrs: \$90. Difference: \$10.



**Well done checking your answers!**

*Keep practicing to strengthen your skills.*



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THANK YOU

## Enjoyed This Preview?

### Get the Full Book!

*This preview shows just a small sample of what's inside.*

*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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