3 Utah RISE Grade 8 Math Practice Tests

Full-Length Test Prep with Detailed Answer Explanations

Dr. A. Nazari

3 Practice Tests

Welcome!

This book contains **3 full-length practice tests** designed to prepare you for your Grade 8 math assessment. Each test covers all six major topics:

📖 *Irrational Numbers*   📖 *Powers & Scientific Notation*

📖 *Linear Equations*   📖 *Functions*

📖 *Geometry*   📖 *Data & Relationships*

Every test includes **detailed answer explanations** so you can learn from each question.

Practice builds confidence. Confidence builds results.

> 66 *Three tests is a great start. Take your time, review each answer, and watch yourself improve!* 99

📖 How to Use This Book 📖

Get the most out of your 3 practice tests

📋 What's Inside

- *3 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* — not just the correct answer, but a step-by-step solution showing the reasoning behind every problem.

- *Formula Reference Sheet* — key formulas and concepts you need for the tests, all in one place.

- *Test Tracker* — record your scores and monitor your improvement across all three tests.

🕐 Suggested Study Schedule

Space your tests at least one week apart to allow time for review:

Test 1   Take this test untimed. Focus on understanding each problem. After finishing, review the answer key and note which topics need work.

Test 2   Set a timer (about 70 minutes). Practice pacing yourself. Compare your results with Test 1 — which topics improved?

Test 3   Full test conditions: timed, quiet space, no notes. Treat it like the real test day. Compare with Test 1 to see your growth.

✏️ Types of Questions

🔘 **Multiple Choice:** *Four answer options — only one is correct. Work the problem first, then match your answer to the choices.*

✏️ **Short Answer & Constructed Response:** *Show your full solution: equations, substitutions, simplifications, and a clear final answer.*

📊 **Graphing & Data:** *Some questions require plotting points, drawing lines, or interpreting graphs and scatter plots. Always label axes and use a straightedge.*

Tip: *After each test, don't just check your score — read the full explanation for every problem you got wrong. Understanding why the correct method works is what builds lasting skills.*

💡 *Test-Taking Tips* 💡

Strategies to help you perform your best

✏️ *How to Approach Every Problem*

1. **Read the entire problem carefully.** *Identify what is given and what is being asked. Underline key words like "simplify," "solve," or "graph."*

2. **Set up your work before calculating.** *Write the formula, draw a diagram, or set up the equation before substituting numbers.*

3. **Solve step by step.** *Show every operation. Label your units and variables.*

4. **Check your answer.** *Plug it back into the original equation. Ask yourself: does this answer make sense?*

5. **Re-read the question.** *Make sure you answered exactly what was asked.*

⚠️ *Common Grade 8 Mistakes to Avoid*

⚠️ **Exponent rules:** $a^m \cdot a^n = a^{m+n}$, *but* $(a^m)^n = a^{mn}$. *Don't mix these up.*

⚠️ **Slope:** *Rise over run, not run over rise. Check the sign of both differences.*

⚠️ **Functions:** *One input → one output. Use the vertical line test for graphs.*

⚠️ **Scientific notation:** *The coefficient must be* ≥ 1 *and* < 10.

⚠️ **Volume:** *Cone =* $\frac{1}{3}$ *of cylinder; sphere =* $\frac{4}{3}\pi r^3$. *Know which formula to use.*

✅ Good Test Habits

- Answer the questions you know first, then go back to harder ones

- Show your work on every problem — even multiple-choice

- Use estimation to check if your answer is reasonable

- On graphing questions, plot at least 3 points before drawing a line

- Never leave a question blank — eliminate wrong choices and make your best guess

> **"** The most important thing after each practice test is reviewing your mistakes. Don't just look at the right answer — understand **why** the correct method works and **where** your approach went wrong. **"**

Grade 8 Formula Reference

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

X¹ Exponent Rules

$$a^m \cdot a^n = a^{m+n} \qquad (a^m)^n = a^{mn} \qquad (ab)^n = a^n \cdot b^n$$

$$\frac{a^m}{a^n} = a^{m-n} \qquad a^0 = 1 \ (a \neq 0) \qquad a^{-n} = \frac{1}{a^n}$$

Lines & Linear Equations

Slope: $m = \dfrac{y_2 - y_1}{x_2 - x_1} = \dfrac{rise}{run}$ **Slope-intercept:** $y = mx + b$ **Proportional:** $y = mx$

m = slope   *b = y-intercept*   *Parallel lines: same slope*   *Proportional: passes through origin*

Scientific Notation

$a \times 10^n$ *where* $1 \leq |a| < 10$ **Multiply:** *add exponents*   **Divide:** *subtract exponents*

√x 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** $V = \dfrac{1}{3}\pi r^2 h$ **Sphere** $V = \dfrac{4}{3}\pi r^3$

⬚ Angle Relationships

Triangle angle sum: $180°$ **Exterior angle** = sum of two remote interior angles

Parallel lines + transversal: Alternate interior angles are equal • Co-interior angles sum to $180°$

⌁ Functions

Each input → exactly one output   **Vertical line test:** if any vertical line hits graph more than once ⇒ 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.

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. The decimal expansion of a number is $0.45454545\ldots$. Is this number rational or irrational?

Your Answer:

2. What fraction in simplest form equals $0.\overline{090909\ldots}$?

Your Answer:

3. A square garden has an area of 35 square feet. Estimate the side length to one decimal place.

Your Answer:

4. Estimate $\sqrt{3} + \sqrt{7}$ to one decimal place.

Your Answer:

5. Which equation has exactly one real solution?

(A) $x^2 = 16$

(B) $x^3 = 8$

(C) $x^2 = 100$

(D) $x^2 = 4$

6. The mass of a proton is approximately 1.67×10^{-27} kilograms. What does the exponent -27 tell you?

(A) The proton weighs 27 kilograms

(B) The decimal point moves 27 places to the right

(C) The number is extremely small, with 26 zeros after the decimal point before the 167

(D) The proton weighs -27 kilograms

7. *According to a calculator display, the answer to a computation is 3.5E8. What does this mean?*

(A) $3.5 \times 8 = 28$

(B) $3.5 \times 10^8 = 350{,}000{,}000$

(C) 3.58

(D) 35×10^8

8. *If $y = kx$ and $y = 36$ when $x = 9$, what is y when $x = 5$?*

(A) 15

(B) 20

(C) 25

(D) 30

9. *A line has slope -4 and passes through $(1, 9)$. What is y when $x = 3$?*

Your Answer:

10. *Solve $2(3x + 4) - x = 5x + 1$.*

(A) $x = -7$

(B) $x = 7$

(C) *No solution*

(D) *Infinitely many solutions*

⭐ *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 Rational **2** $\frac{1}{11}$ **3** ≈ 5.9 *feet* **4** ≈ 4.4 **5** B **6** C **7** B

8 B **9** 1 **10** C

💡 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 *The digits 45 repeat, so $0.\overline{45} = \frac{45}{99} = \frac{5}{11}$. A repeating decimal is always rational.*

2 *$0.\overline{09} = 0.090909\ldots$. Then $99x = 9$, so $x = \frac{9}{99} = \frac{1}{11}$.*

3 *Side $= \sqrt{35}$. $5.9^2 = 34.81$ and $6.0^2 = 36$. Since 35 is closer to 34.81, $\sqrt{35} \approx 5.9$.*

4 $\sqrt{3} \approx 1.732$ and $\sqrt{7} \approx 2.646$. Adding: $1.732 + 2.646 = 4.378 \approx 4.4$.

5 $x^3 = 8$ has one real solution, $x = 2$. Equations of the form $x^2 = p$ (with $p > 0$) have two solutions.

6 A negative exponent of -27 means the decimal moves 27 places left, making the number very small. There are 26 zeros after the decimal point before the digits 167.

7 On most calculators, "E8" means $\times 10^8$. So $3.5E8 = 3.5 \times 10^8$.

8 $k = \frac{36}{9} = 4$. When $x = 5$: $y = 4(5) = 20$.

9 From $(1, 9)$ to $(3, y)$: slope $= \frac{y-9}{3-1} = -4$, so $y - 9 = -8$, giving $y = 1$.

10 Left side: $6x + 8 - x = 5x + 8$. So $5x + 8 = 5x + 1$. Subtract $5x$: $8 = 1$, which is false. No solution.

✓

Well done checking your answers!

Keep practicing to strengthen your skills.

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

Available on Amazon and Teachers Pay Teachers

🌐 Visit us at **ViewMath.com** for free resources and more books!