

5 Full-Length Indiana ILEARN Grade 8 Math Practice Tests

Extra Practice for Test Day Success

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5 Practice Tests

🌱 Grade 8 Mathematics 🌱



Welcome!

*This book contains **5 full-length practice tests** to prepare you for your Grade 8 math assessment. Each test covers every major topic you need to know:*

📖 Irrational Numbers 📖 Powers & Scientific Notation

📖 Linear Equations 📖 Functions

📖 Geometry 📖 Data & Relationships

With five tests, you'll have plenty of opportunity to identify weak areas, practice them, and build real confidence.

The more you practice, the more prepared you'll be.

“ Five tests give you a real advantage. Use each one to get stronger before the real thing! ”



How to Use This Book

A 5-week plan for effective test preparation

What's Inside

- **5 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 complete step-by-step solution to help you learn from your mistakes.
- **Formula Reference Sheet** — all the key Grade 8 formulas and concepts organized in one page for quick access.
- **Test Tracker** — record scores and track improvement across all five tests.

Your 5-Week Study Path



Space tests one week apart. Use the days between to study the topics you missed.

Types of Questions

- **Multiple Choice:** Four answer options. Work the problem yourself first, then match your answer. Eliminate clearly wrong options to narrow your choices.
- **Short Answer & Constructed Response:** Write your full solution. Show all equations, substitutions, and simplification steps. Partial credit is given for correct work even if the final answer is missing or wrong.
- **Graphing & Data:** Plot points, draw lines, and interpret graphs and scatter plots. Label axes clearly and use a ruler for straight lines.



Tip: Five tests is enough to see real progress. Space them out, study between them, and always review the full explanation for every problem you get wrong.

PREVIEW



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💡 Test-Taking Tips 💡

Five key strategies for success

Five Strategies for Every Problem

1. **Read carefully.** Don't skim. Read every word of the problem and identify exactly what is being asked before you start calculating.
2. **Estimate first.** Before solving, make a rough estimate. This helps you catch major errors in your final answer.
3. **Show your work.** Write the formula, substitute values, and simplify step by step. This earns partial credit and reduces mistakes.
4. **Check your answer.** Plug your result back into the original equation or condition. Does it work?
5. **Manage your time.** If you're stuck for more than 2 minutes, skip the problem and come back later. Don't let one question eat your time.

Common Mistakes to Watch For

-  **Negative exponents:** $a^{-n} = \frac{1}{a^n}$, not a negative number.
-  **Slope sign:** When a line goes down from left to right, the slope is negative.
-  **Linear vs. nonlinear:** A function is linear only if its rate of change is constant.
-  **Transformations:** Rotation $\neq$ reflection. Know which changes orientation.
-  **Scatter plots:** Correlation does not mean causation. Read the question carefully.

 Don't Forget

- Circle keywords in the problem: “approximately,” “exactly,” “which equation”
- For word problems, translate sentences into equations one phrase at a time
- Draw diagrams for geometry problems even if one isn't provided
- Convert between forms (fraction $\leftrightarrow$ decimal $\leftrightarrow$ percent) when it helps
- For systems of equations, check your solution in both equations



“After each practice test, go back to every problem you got wrong and figure out *where* your approach broke down. That single habit makes the biggest difference.”



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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°

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 $\rightarrow$ 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 student claims that $\sqrt{36}$ is irrational because it involves a square root. What is wrong with this reasoning?

- (A) Square roots are always rational. (B) $\sqrt{36} = 6$, which is a whole number and therefore rational.
- (C) $\sqrt{36}$ is not a real number. (D) Only cube roots can be irrational.

2. Which is larger: $\sqrt{8}$ or 3?

- (A) $\sqrt{8}$, because $\sqrt{8} \approx 4$ (B) 3, because $3^2 = 9 > 8$
- (C) They are equal. (D) $\sqrt{8}$, because $8 > 3$

3. What is the best estimate for $\sqrt{5} + \sqrt{3}$?

- (A) $\sqrt{8} \approx 2.8$ (B) 3.0
- (C) 4.0 (D) 8.0

4. A student simplifies $2^3 \cdot 2^4$ and gets 4^7 . What mistake did the student make?

- (A) Added the exponents instead of multiplying them (B) Multiplied the bases instead of keeping the same base
- (C) Subtracted the exponents instead of adding them (D) Forgot to apply the zero exponent rule

5. Evaluate $\sqrt{169} - \sqrt[3]{27}$.

- (A) 10 (B) 142
- (C) 16 (D) 7



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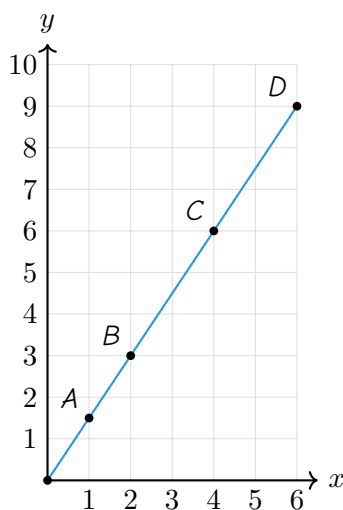
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6. Subtract: $5.1 \times 10^9 - 4.6 \times 10^9$.

Your Answer:

7. Look at the graph below. Which point on the line gives the unit rate directly?



(A) Point A at (1, 1.5)

(B) Point B at (2, 3)

(C) Point C at (4, 6)

(D) Point D at (6, 9)

8. Find the slope of the line through $(-5, -3)$ and $(5, 7)$.

Your Answer:

9. A line passes through $(0, 4)$ and $(2, 10)$. What is its equation?

(A) $y = 2x + 4$

(B) $y = 3x + 4$

(C) $y = 4x + 2$

(D) $y = 5x + 4$



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10. The table shows total costs for two cell phone companies.

Months	Company X	Company Y
1	\$35	\$50
2	\$60	\$65
3	\$85	\$80
4	\$110	\$95

Between which two months do the costs become equal?

- (A) Between month 1 and month 2 (B) Between month 2 and month 3
- (C) Between month 3 and month 4 (D) They are never equal.



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★ 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 B

2 B

3 C

4 B

5 A

6 5×10^8

7 A

8 1

9 B

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 36 is a perfect square, so $\sqrt{36} = 6$, which is rational. Not all square roots are irrational — only those of non-perfect-squares.

2 $3^2 = 9 > 8$, so $3 > \sqrt{8}$. In fact, $\sqrt{8} \approx 2.83$.



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3 $\sqrt{5} \approx 2.236$ and $\sqrt{3} \approx 1.732$. Adding: $2.236 + 1.732 = 3.968 \approx 4.0$.

4 When multiplying powers with the same base, you keep the base and add the exponents: $2^3 \cdot 2^4 = 2^7$, not 4^7 . The student incorrectly multiplied the bases.

5 $\sqrt{169} = 13$ and $\sqrt[3]{27} = 3$. So $13 - 3 = 10$.

6 $5.1 - 4.6 = 0.5$. So $0.5 \times 10^9 = 5 \times 10^8$.

7 The unit rate is the y -value when $x = 1$. Point A is at $(1, 1.5)$, so the unit rate is 1.5.

8 $m = \frac{7 - (-3)}{5 - (-5)} = \frac{10}{10} = 1$.

9 $m = \frac{10 - 4}{2 - 0} = 3$. The y -intercept is 4. So $y = 3x + 4$.

10 At month 2, X is cheaper ($\$60 < \65). At month 3, Y is cheaper ($\$80 < \85). They cross between months 2 and 3.



Well done checking your answers!

Keep practicing to strengthen your skills.



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THANK YOU

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- ✓ *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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