5 Full-Length South Dakota SBA 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.

> 66 *Five tests give you a real advantage. Use each one to get stronger before the real thing!* 99

📖 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

1	2	3	4	5
Untimed *Find your level*	*Study weak topics, soft timer*	*Timed (70 min)* *Build pacing*	*Timed, focus on accuracy*	*Full test conditions*

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.*

💡 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 ↔ decimal ↔ 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.* ❞

Grade 8 Formula Reference

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

X¹ Exponent Rules

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

$\dfrac{a^m}{a^n} = a^{m-n}$ $a^0 = 1 \; (a \neq 0)$ $a^{-n} = \dfrac{1}{a^n}$

📈 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.

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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. What is $0.\overline{5}$ written as a fraction in simplest form?

(A) $\frac{5}{10}$

(B) $\frac{5}{9}$

(C) $\frac{1}{2}$

(D) $\frac{1}{5}$

3. Which is the best approximation of $\sqrt{30}$ to one decimal place?

(A) 5.1

(B) 5.3

(C) 5.5

(D) 5.8

4. What is $(\sqrt{5})^2$?

(A) $\sqrt{10}$

(B) 25

(C) 5

(D) 2.236

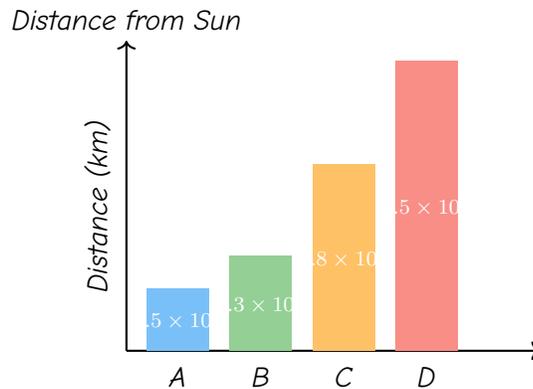**5.** Evaluate $\sqrt{169} - \sqrt[3]{27}$.

(A) 10

(B) 142

(C) 16

(D) 7

6. How many times as large is 6×10^7 compared to 3×10^4?

Your Answer:

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7. The bar chart compares the distances of four planets from the Sun. Which planet is approximately 10 times farther from the Sun than Planet A?

Distance from Sun

A Planet B B Planet C

C Planet D D None of the planets

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8. A painter paints 3 rooms in 6 hours. At this rate, how many hours will it take to paint 8 rooms?

Your Answer:

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9. What is the slope of a horizontal line?

A 1 B -1

C 0 D Undefined

10. Look at the two expressions on the balance. What can you conclude?

$$3(x + 2) \quad = \quad 3x + 6$$

(A) $x = 0$

(B) $x = 2$

(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 B	2 B	3 C	4 C	5 A	6 2,000 *times*	7 C	8 16 *hours*

9 C	10 D

💡 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 *Let* $x = 0.555\ldots$. *Then* $10x = 5.555\ldots$. *Subtract:* $9x = 5$, *so* $x = \frac{5}{9}$. *This is already in simplest form.*

3 $5.4^2 = 29.16$ and $5.5^2 = 30.25$. Since 30 is very close to 30.25, $\sqrt{30} \approx 5.5$.

4 By definition, $(\sqrt{5})^2 = 5$. Squaring a square root gives back the original number.

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

6 $\frac{6 \times 10^7}{3 \times 10^4} = 2 \times 10^3 = 2{,}000$.

7 Planet A is 1.5×10^8 km away. Ten times that is 1.5×10^9 km, which matches Planet D.

8 Rate $= \frac{6}{3} = 2$ hours per room. For 8 rooms: $2 \times 8 = 16$ hours.

9 A horizontal line has no rise, so $m = \frac{0}{run} = 0$.

10 $3(x + 2) = 3x + 6$ simplifies to $3x + 6 = 3x + 6$, which is always true. Infinitely many solutions.

✓

Well done checking your answers!

Keep practicing to strengthen your skills.

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