

7 Ohio OST Grade 9 Math Practice Tests

Comprehensive Test Prep with Detailed Answers

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7 Practice Tests

★ Algebra 1 ★

Welcome!

This book contains **7 full-length practice tests** designed to give you thorough preparation for your Algebra 1 assessment. Each test covers all nine major chapters:

- 📖 Foundations & Exponents 📖 Linear Equations & Inequalities
- 📖 Functions 📖 Linear Functions & Graphing
- 📖 Systems of Equations 📖 Polynomials & Factoring
- 📖 Quadratic Functions 📖 Exponential Functions
- 📖 Data & Statistics

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 chapter 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 9 chapters of Algebra 1: foundations & exponents, linear equations & inequalities, functions, linear functions & graphing, systems of equations, polynomials & factoring, quadratics, exponential functions, and data & statistics.
- **Detailed Answer Explanations** — every question includes a step-by-step solution so you can understand the reasoning.
- **Formula Reference Sheet** — essential Algebra 1 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 (120 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 and data displays. Use a ruler and label everything clearly.



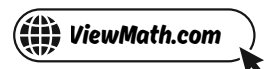
Tip: With 7 tests, you have the depth to truly master every chapter. Don't rush through them — quality review between tests is what drives real improvement.



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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 equation or formula 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 Algebra 1

-  **Combining like terms:** $3x + 2y \neq 5xy$. Only combine terms with the same variable and exponent.
-  **Exponent rules:** $x^2 \cdot x^3 = x^5$ (add exponents), but $(x^2)^3 = x^6$ (multiply exponents).
-  **Inequality direction:** When multiplying or dividing by a negative, flip the inequality sign.
-  **Function notation:** $f(3)$ means the output when input is 3, not $f \times 3$.
-  **Quadratic formula:** The denominator is $2a$, not just a . Don't forget the \pm .

Smart Strategies

- Answer the questions you're most confident about first
- Underline keywords: "solve," "simplify," "factor," "graph," "explain"
- For word problems, define your variable and translate step by step
- When graphing, always plot at least two points and connect with a ruler
- 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 chapter (not just the question number) so you know what to study
- Before the next test, review those chapters 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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What You'll Need

Gather these materials before you begin

Materials Checklist

- ✓ **Sharpened Pencils** — #2 pencils, at least two
- ✓ **Good Eraser** — for clean corrections
- ✓ **Scratch Paper** — for working out problems
- ✓ **Graphing Calculator** — if allowed by your state test
- ✓ **Ruler / Straightedge** — for graphing lines
- ✓ **Quiet Space** — no distractions
- ✓ **Focused Mind** — ready to do your best

Allowed Materials

- ✓ Pencils and eraser
- ✓ Scratch paper (provided on official test day)
- ✓ Graphing calculator (most Algebra 1 state tests allow calculators — check your state's policy)
- ✓ Ruler or straightedge

Not Allowed

- ✗ Cell phone or any electronic device
- ✗ Notes, textbooks, or reference sheets (unless provided by the test)
- ✗ Help from others during the test
- ✗ Calculator apps or internet access

♥ A Note for Parents & Guardians

Seven tests allow for deep, thorough preparation. Plan one test every 4–5 days with study sessions in between.

How to help:

- Tests 1–2 should be untimed — let your student explore and learn.
- After each test, review the answer explanations together. Focus on the chapter, not just individual questions.
- Use the Test Tracker to visualize progress across all 7 tests.
- For extra topic support, pair this book with our **Algebra 1 Study Guide** or **Algebra 1 Workbook**.

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Algebra 1 Reference Sheet

Key formulas and facts you may use during each practice test

★ Properties & Exponents

Commutative: $a + b = b + a$; $ab = ba$

Associative: $(a + b) + c = a + (b + c)$

Distributive: $a(b + c) = ab + ac$

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

$\frac{a^m}{a^n} = a^{m-n}$ $a^0 = 1$

$a^{-n} = \frac{1}{a^n}$ $(ab)^n = a^n b^n$

★ Linear Equations & Inequalities

Slope-intercept: $y = mx + b$

Point-slope: $y - y_1 = m(x - x_1)$

Standard form: $Ax + By = C$

Slope: $m = \frac{y_2 - y_1}{x_2 - x_1}$

Parallel lines: same slope

Perpendicular: $m_1 \cdot m_2 = -1$

★ Functions

A function maps each input to exactly one output.

Vertical line test: passes through at most one point.

Domain: set of all inputs (x -values)

Range: set of all outputs (y -values)

$f(x)$ notation: $f(3)$ means substitute $x = 3$

★ Systems of Equations

Solve by graphing, substitution, or elimination

One solution: lines intersect (consistent)

No solution: lines are parallel

Infinitely many: same line (dependent)

★ Polynomials & Factoring

$(a + b)^2 = a^2 + 2ab + b^2$

$(a - b)^2 = a^2 - 2ab + b^2$

$a^2 - b^2 = (a + b)(a - b)$

To factor $ax^2 + bx + c$: find two numbers that multiply to ac and add to b

★ Quadratic Functions

Standard form: $y = ax^2 + bx + c$

Vertex form: $y = a(x - h)^2 + k$

Vertex: (h, k) ; axis of symmetry: $x = h$

Quadratic formula: $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$

Discriminant: $b^2 - 4ac$

> 0 : two real solutions $= 0$: one < 0 : none

★ Exponential Functions & Sequences

Growth: $y = a \cdot b^x$ where $b > 1$

Decay: $y = a \cdot b^x$ where $0 < b < 1$

Arithmetic sequence: $a_n = a_1 + (n - 1)d$

Geometric sequence: $a_n = a_1 \cdot r^{n-1}$

★ Data & Statistics

Line of best fit: approximates scatter plot trend

Correlation: positive, negative, or none

Correlation \neq causation

Residual = actual - predicted

Good fit: residuals small, randomly scattered

★ Square Roots & Radicals

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

$\sqrt{ab} = \sqrt{a} \cdot \sqrt{b}$ $\sqrt{\frac{a}{b}} = \frac{\sqrt{a}}{\sqrt{b}}$

Simplify: $\sqrt{50} = \sqrt{25 \cdot 2} = 5\sqrt{2}$

My Test Tracker

Record your scores and track your growth

Name: _____

Start Date: _____

Test 1 – Untimed

Date: _____

Score: _____ / _____

%: _____

Notes: _____

Test 2 – Untimed

Date: _____

Score: _____ / _____

%: _____

Notes: _____

Test 3 – Soft Timer – 120 min

Date: _____

Score: _____ / _____

%: _____

Notes: _____

Test 4 – Timed

Date: _____

Score: _____ / _____

%: _____

Notes: _____

Test 5 – Timed

Date: _____

Score: _____ / _____

%: _____

Notes: _____

Test 6 – Timed – Strict

Date: _____

Score: _____ / _____

%: _____

Notes: _____

Test 7 – Full Test Conditions

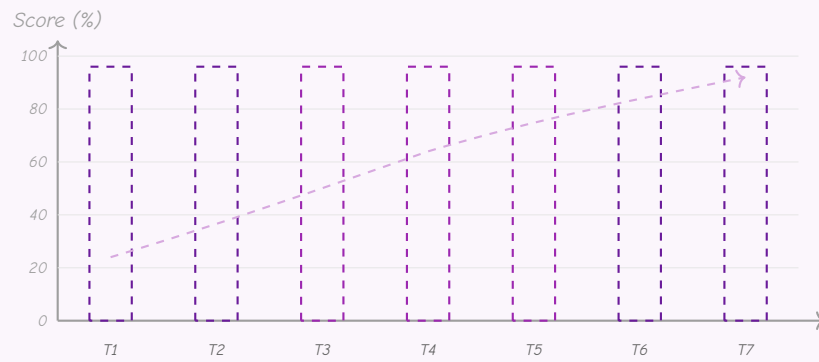
Date: _____

Score: _____ / _____

%: _____

Notes: _____

Score Progress



Shade each bar after every test. Watch your progress!

Final Reflection

The most important thing I learned: _____

The topic where I improved the most: _____

What I want to keep working on: _____



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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. The sum of two numbers is 14 and one number is 4 more than the other. What are the two numbers?

Your Answer:

2. The table below shows an equation with a missing exponent n . Use the rules of exponents to find the value of n .

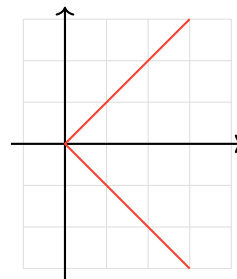
Numerator	Denominator	Result
$x^8 \cdot x^n$	x^3	x^9

Your Answer:

3. Which graph below represents a function?



Graph I



Graph II

- (A) Graph I only (B) Graph II only
 (C) Both Graph I and Graph II (D) Neither Graph I nor Graph II

4. How many solutions does $4(2x + 3) = 2(4x - 1)$ have?

Your Answer:



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5. What type of boundary line does $y \geq \frac{3}{4}x - 1$ have?

Your Answer:

6. A car is bought for \$18,000 and loses 10% of its value each year. What is the car's value after 5 years? Round to the nearest dollar.

Your Answer:

7. Use the quadratic formula to solve the equation represented by the parabola below. The equation is $x^2 - 4x + 3 = 0$.



Your Answer:

8. Expand $(x + 6)^2$. Write the result in standard form.

Your Answer:



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9. Given $f(x) = 4x - 3$ and $g(x) = x + 7$, what is $f(2) + g(2)$?

(A) 14

(B) 12

(C) 16

(D) 18

10. A car's value decreases by approximately 15% each year. Which model type best describes this depreciation?

(A) Linear, because the value decreases at a constant rate.

(B) Quadratic, because the value decreases and then increases.

(C) Exponential decay, because the value decreases by a constant percentage each year.

(D) No model is appropriate for depreciation.



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Answer Key & Explanations



Answer Key

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

Practice Test 1 – Answer Key

1 9 and 5

2 4

3 A

4 no solution

5 Solid

6 \$10,629

7 $x = 1$ and $x = 3$

8 $x^2 + 12x + 36$

9 A

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 Let $x + y = 14$ and $x = y + 4$. Substitute: $(y + 4) + y = 14$, so $2y = 10$ and $y = 5$. Then $x = 9$. The two numbers are 9 and 5.

2 Using the product rule in the numerator: $x^8 \cdot x^n = x^{8+n}$. Then the quotient rule: $\frac{x^{8+n}}{x^3} = x^{8+n-3} = x^{n+5}$. Setting $x^{n+5} = x^9$ gives $n + 5 = 9$, so $n = 4$.



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3 Graph I shows a V-shape; every vertical line crosses it at most once, so it is a function. Graph II shows a sideways V; a vertical line at $x = 2$ crosses it at two points (one above and one below the x -axis), so it is not a function.

4 Distribute: $8x + 12 = 8x - 2$. Subtract $8x$: $12 = -2$. This is a false statement, so the equation has no solution.

5 The symbol \geq includes equality, so points on the boundary line are solutions. A solid line is used for \leq or \geq .

6 The decay factor is $b = 1 - 0.10 = 0.90$. After 5 years: $f(5) = 18,000(0.90)^5 = 18,000 \times 0.59049 \approx \$10,629$.

7 With $a = 1$, $b = -4$, $c = 3$, the discriminant is $D = 16 - 12 = 4$. Then $x = \frac{4 \pm 2}{2}$, giving $x = 3$ or $x = 1$. These match the x -intercepts on the graph.

8 Use the square of a sum pattern: $(x + 6)^2 = x^2 + 2(x)(6) + 6^2 = x^2 + 12x + 36$.

9 Evaluate each function at $x = 2$: $f(2) = 4(2) - 3 = 5$ and $g(2) = 2 + 7 = 9$. Then $f(2) + g(2) = 5 + 9 = 14$.

10 A constant percentage decrease each year means the car retains 85% of its value annually, giving the model $V = V_0(0.85)^t$. This is exponential decay because each year the amount lost is a fixed fraction of the current value, not a fixed dollar amount.

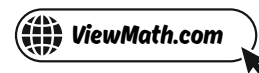


Well done checking your answers!

Keep practicing to strengthen your skills.

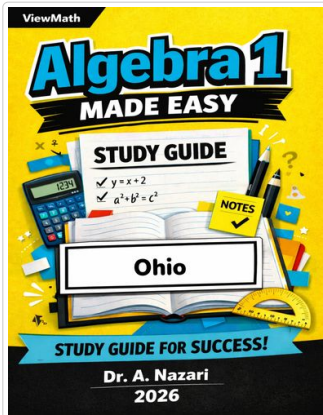


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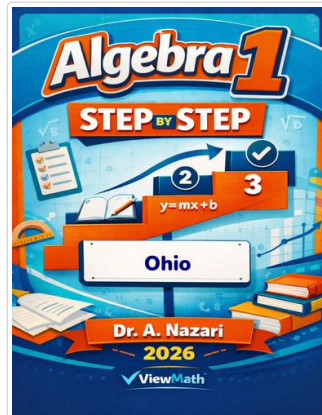
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Study Guide



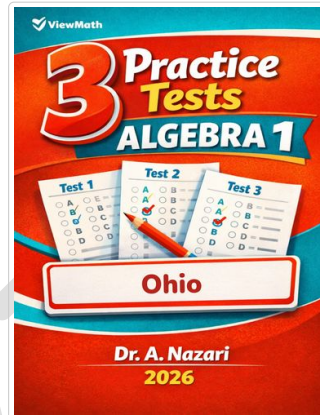
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Step-by-Step



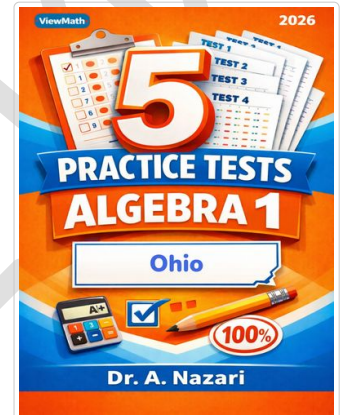
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3 Practice Tests



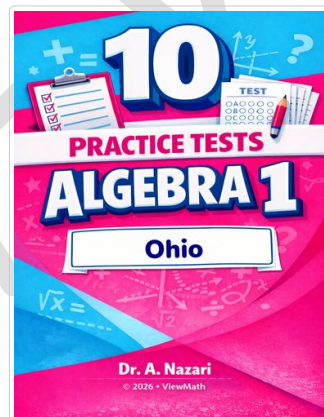
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5 Practice Tests



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10 Practice Tests



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