

3 Oklahoma OSTP EOI Grade 9 Math Practice Tests

Full-Length Test Prep with Detailed Answer Explanations

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3 Practice Tests

★ Algebra 1 ★

Welcome!

This book contains **3 full-length Algebra 1 practice tests** designed to prepare you for your end-of-course assessment. Each test covers all nine major topics:

📖 Foundations of Algebra 📖 Linear Equations

📖 Functions 📖 Linear Functions & Graphs

📖 Systems of Equations 📖 Polynomials & Factoring

📖 Quadratic Functions 📖 Exponential Functions

📖 Data Analysis & Statistics

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

Practice builds confidence. Confidence builds results.

“ Take your time, review each answer explanation, and learn from every mistake. That’s how you grow! ”



How to Use This Book

Your 3-step path to Algebra 1 success


What's Inside


- **3 Full-Length Practice Tests** — each covers all 9 chapters of Algebra 1: real numbers, linear equations & inequalities, functions, graphing, systems of equations, polynomials, quadratics, exponential functions, 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 Algebra 1 formulas and concepts organized in one page for quick access.
- **Test Tracker** — record scores and track improvement across all three tests.


Suggested Study Schedule

1. **Test 1 (Untimed — Diagnostic):** Take the first test without a time limit. This is your baseline. Don't worry about speed—focus on showing your work and trying every question.
2. **Study the gaps:** After scoring Test 1, identify your weakest topics. Spend 5–7 days reviewing those areas before moving to Test 2.
3. **Test 2 (Timed — 120 Minutes):** Take this test with a timer. Practice pacing yourself. Review your answers and compare to Test 1 to see improvement.
4. **Test 3 (Full Test Conditions):** Simulate real test conditions—quiet room, no notes, timed. This is your dress rehearsal.

 **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: After each test, go back and review every question you missed. Read the full explanation and try the problem again on your own. That single habit makes the biggest difference.



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💡 Test-Taking Tips 💡

Five key strategies for Algebra 1 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. Set up before solving.** Write the equation or expression before diving into arithmetic. Label your variables and identify what you're solving for.
- 3. Show your work.** Write each step clearly—distribute, combine like terms, isolate the variable. 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. Re-read the question.** Make sure you answered what was actually asked. Many mistakes come from solving correctly but answering the wrong question.

Common Algebra 1 Mistakes to Watch For

- ⚠️ Sign errors:** When multiplying or dividing an inequality by a negative, flip the sign.
- ⚠️ Distributing negatives:** $-(3x - 5) = -3x + 5$, not $-3x - 5$.
- ⚠️ Slope:** Rise over run, $m = \frac{y_2 - y_1}{x_2 - x_1}$. Don't swap x and y .
- ⚠️ Factoring:** Always check by multiplying your factors back out.
- ⚠️ Quadratic formula:** Don't forget the "2a" in the denominator, not just "a".

 Don't Forget

- Circle keywords in word problems: "how many more," "total," "rate"
- For word problems, define your variable first: "Let $x = \dots$ "
- When graphing, plot at least two points and check a third
- Convert between forms when it helps: slope-intercept \leftrightarrow standard
- For systems, check your solution in both equations



“ The best way to learn algebra is to understand **why** each step works, not just memorize procedures. When you review your mistakes, ask: Where did my thinking go wrong? ”



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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's test
- ✓ **Ruler / Straightedge** — for graphing
- ✓ **Quiet Space** — no distractions
- ✓ **Focused Mind** — ready to do your best

Typically Allowed

- ✓ Pencils and eraser
- ✓ Scratch paper (provided on official test day)
- ✓ Graphing calculator (varies by state—check your test rules)
- ✓ Ruler or straightedge

Not Allowed

- ✗ Cell phone or any electronic device (other than allowed calculator)
- ✗ Notes, textbooks, or reference sheets (beyond what's provided)
- ✗ Help from others during the test

 **A Note for Parents & Guardians**

Three tests provide a focused, manageable study plan. Space them **one week apart** with study days in between.

How to help:

- Test 1 should be untimed — focus on learning, not speed.
- After each test, review the full solutions together. Ask: “Which topics were hardest? Let’s study those before the next one.”
- Use the Test Tracker page to visualize progress over time.
- For extra support on specific topics, pair this book with our **Algebra 1 Study Guide**.

PREVIEW



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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 progress

Name: _____

Start Date: _____

Test 1 (Untimed – Diagnostic)

Date: _____

Score: _____ / _____

Percent: _____

Topics to review: _____

Test 2 (Timed – 120 Minutes)

Date: _____

Score: _____ / _____

Percent: _____

Improved on: _____

Still need work: _____

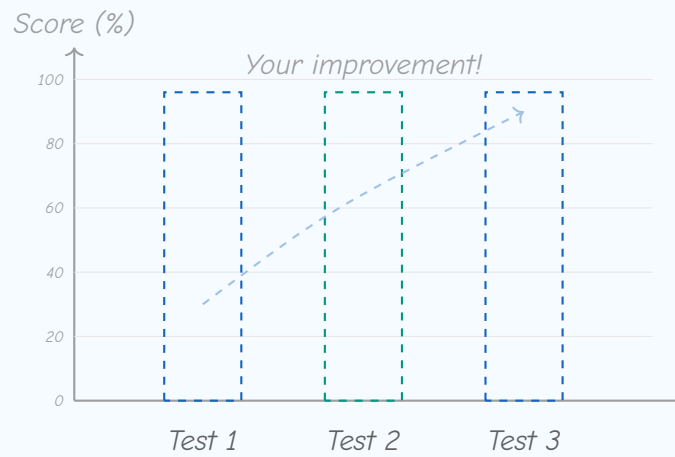
Test 3 (Timed – Full Test Conditions)

Date: _____

Score: _____ / _____

Percent: _____

Total improvement since Test 1: _____

 Score Progress


Shade each bar to your score after each test.

 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!

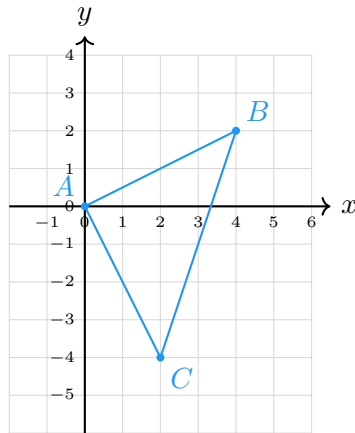


1. The table below shows the monthly cost (in dollars) of two streaming plans. Plan A has a \$40 signup fee and costs \$25 per month. Plan B has an \$80 signup fee and costs \$15 per month. After how many months will both plans have the same total cost?

Month	Plan A	Plan B
1	\$65	\$95
2	\$90	\$110
3	\$115	\$125
4	?	?
5	?	?

Your Answer:

2. The graph shows triangle ABC with vertices $A(0, 0)$, $B(4, 2)$, and $C(2, -4)$.



Which vertex contains the right angle?

- (A) A
 (B) B
 (C) C
 (D) No vertex contains a right angle.



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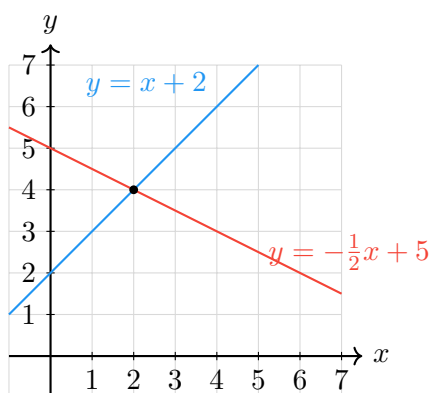
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3. A student simplified $-3(2x - 7)$ and got $-6x - 21$. What error did the student make?

- (A) The student did not distribute -3 to the second term. (B) The student multiplied $-3 \times (-7)$ incorrectly; the result should be $+21$.
- (C) The student used the commutative property instead of the distributive property. (D) The student should have added -3 to each term.

4. Two lines are graphed on the coordinate plane below. Classify the system as consistent and independent, consistent and dependent, or inconsistent.



Your Answer:



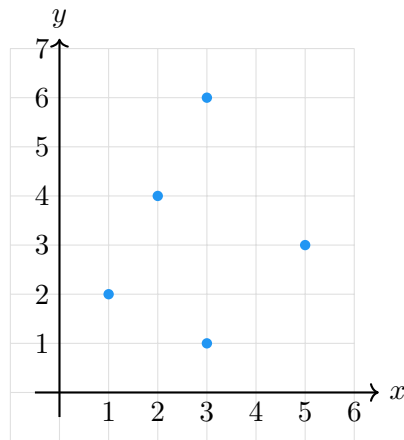
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5. The graph below shows a set of plotted points. Does the relation pass the vertical line test?



- (A) Yes, because every point is in a different row.
- (B) No, because there are two points at $x = 3$.
- (C) Yes, because all y -values are positive.
- (D) No, because the points do not form a straight line.



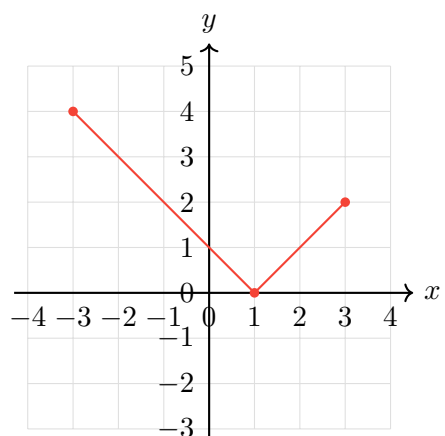
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9. The graph shows function g . For which input does $g(x) = 0$?



(A) $x = -3$

(B) $x = 0$

(C) $x = 1$

(D) $x = 3$

10. A model predicts $y = 68$ at a certain point. The actual value is 72. What is the residual?

Your Answer:



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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 4 | 2 A | 3 B | 4 Consistent and independent | 5 B | 6 C | 7 B |
| 8 B | 9 C | 10 4 | | | | |

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 Plan A costs $40 + 25m$ and Plan B costs $80 + 15m$. Set them equal: $40 + 25m = 80 + 15m$. Subtract 15m and 40: $10m = 40$, so $m = 4$ months.

2 Slope of $\overline{AB} = \frac{2}{4} = \frac{1}{2}$. Slope of $\overline{AC} = \frac{-4}{2} = -2$. Since $\frac{1}{2} \times (-2) = -1$, sides AB and AC are perpendicular, so the right angle is at vertex A.



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3 Using the distributive property: $-3(2x - 7) = -3 \cdot 2x + (-3)(-7) = -6x + 21$. The student forgot that a negative times a negative is positive, so $(-3)(-7) = +21$, not -21 .

4 The two lines have different slopes (1 and $-\frac{1}{2}$) and intersect at exactly one point, $(2, 4)$. A system with one solution is consistent and independent.

5 A vertical line at $x = 3$ passes through the points $(3, 6)$ and $(3, 1)$. Because that vertical line hits two points, the relation fails the vertical line test and is not a function.

6 From the graph, the decay factor is $b = \frac{70}{100} = 0.70$. The percent rate of decay is $r = 1 - 0.70 = 0.30 = 30\%$ per year.

7 Volume equals length times width times height. First multiply the binomials: $(x+2)(x-1) = x^2 + x - 2$. Then multiply by the height: $3(x^2 + x - 2) = 3x^2 + 3x - 6$.

8 Factor: $x^2 + 4x + 4 = (x + 2)^2 = 0$, so $x = -2$ is the only solution. The parabola touches the x -axis at exactly one point (the vertex).

9 The graph crosses the x -axis at the point $(1, 0)$. Since $g(1) = 0$, the output is zero when $x = 1$.

10 Residual = actual - predicted = $72 - 68 = 4$. A positive residual means the actual value is 4 above the prediction.



Well done checking your answers!

Keep practicing to strengthen your skills.



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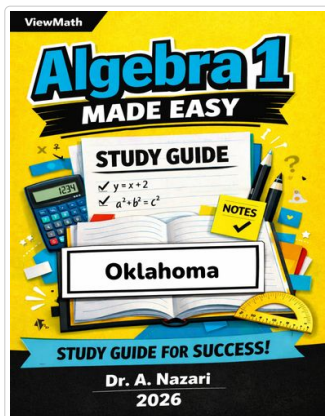


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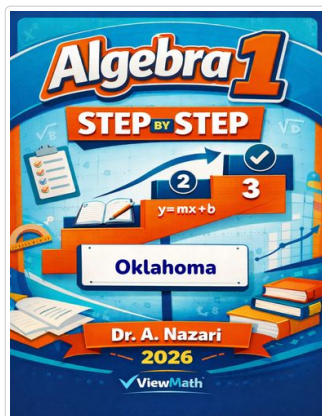
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Study Guide



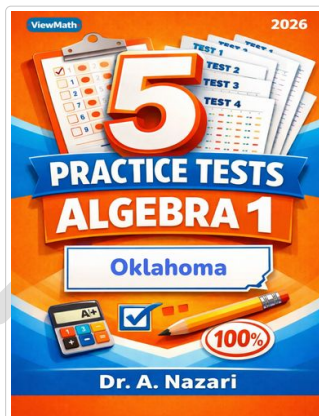
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Step-by-Step



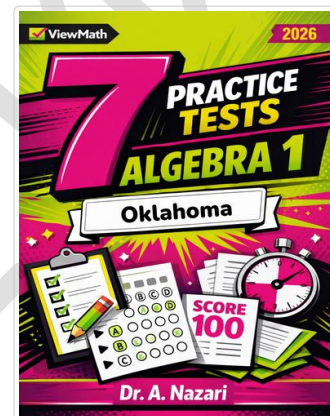
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5 Practice Tests



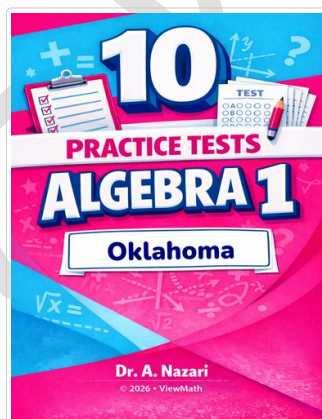
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7 Practice Tests



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10 Practice Tests



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