3 North Carolina NC EOC Grade 9 Math Practice Tests

Full-Length Test Prep with Detailed Answer Explanations

Dr. A. Nazari

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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.*

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 $x = \ldots$"*
- *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?"*

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****.*

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

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

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

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

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 $\quad = 0$: one $\quad < 0$: 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: $1, 4, 9, 16, 25, 36, 49, 64, 81, 100, 121, 144$

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

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: _____

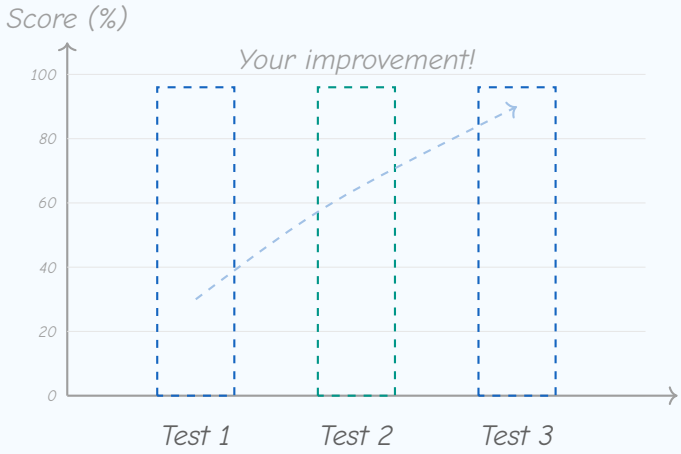
Improved on: _____ Still need work: _____

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: _____

YOUR ONLINE COMPANION

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- ***Progress Tracking*** *— See your mastery grow across all Grade A1 math topics*
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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 table below shows a pattern of powers of 2. What value belongs in the box marked "?"?*

2^4	2^3	2^2	2^1	2^0	2^{-1}	2^{-2}
16	8	4	2	?		

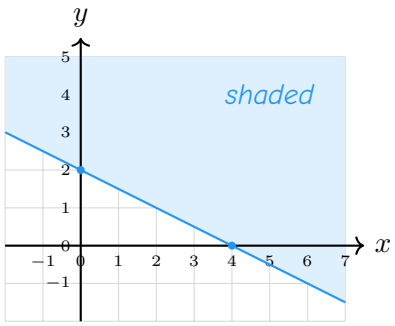
(A) 0

(B) 1

(C) -1

(D) 2

3. *Which inequality matches the graph below?*



The solid boundary line passes through $(0, 2)$ *and* $(4, 0)$*. The region above the line is shaded.*

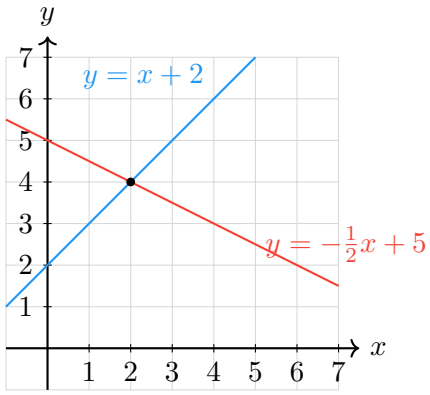
(A) $y < -\frac{1}{2}x + 2$

(B) $y > -\frac{1}{2}x + 2$

(C) $y \leq -\frac{1}{2}x + 2$

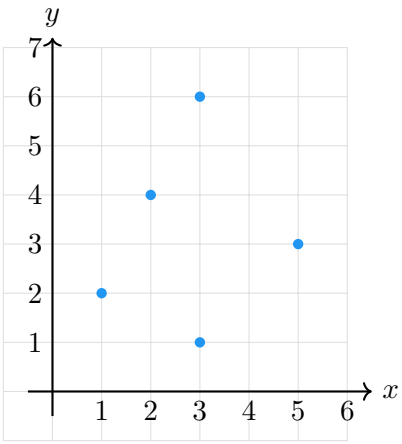
(D) $y \geq -\frac{1}{2}x + 2$

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



Your Answer:

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.*

6. *A student claims that $x^2 - 6x + 10 = 0$ has two real solutions because the coefficient of x^2 is positive. Which statement best explains the error?*

(A) *The student confused the leading coefficient with the discriminant.*

(B) *The student forgot to factor the equation first.*

(C) *The student divided by zero.*

(D) *The student should have used completing the square instead.*

7. *What is the quotient of $(2x^2 + x - 6) \div (2x - 3)$?*

(A) $x + 2$

(B) $x - 2$

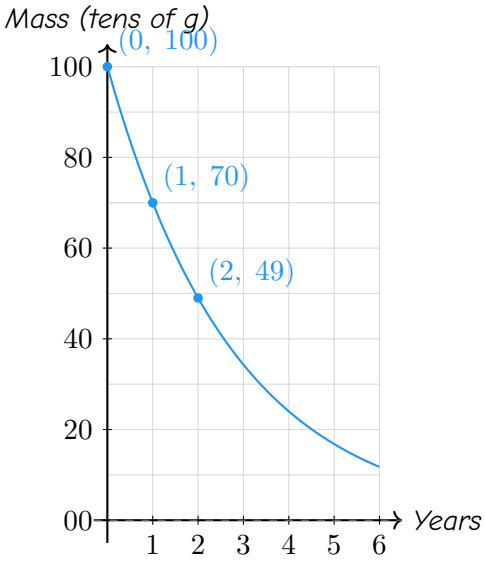
(C) $x + 3$

(D) $2x + 2$

8. Simplify $\sqrt{12} \cdot \sqrt{3}$.

Your Answer:

9. The graph below shows the mass of a decaying substance over time.



What is the percent rate of decay per year?

(A) 70%

(B) 49%

(C) 30%

(D) 0.7%

10. A trend line has the equation $y = -1.5x + 40$. Predict the value of y when $x = 10$.

Your Answer:

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 B	3 D	4 Consistent and independent	5 B	6 A	7 A
8 6	9 C	10 25				

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 *The pattern shows each value being divided by 2 moving from left to right: $16, 8, 4, 2, \ldots$ Dividing 2 by 2 gives 1. This confirms the zero exponent rule: $2^0 = 1$.*

3 *The slope is $m = \frac{0-2}{4-0} = -\frac{1}{2}$ and the y-intercept is 2. A solid line means $\leq$ or $\geq$, and shading above means $y \geq$. The inequality is $y \geq -\frac{1}{2}x + 2$.*

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 *The number of real solutions depends on the discriminant, not the leading coefficient. Here $D = 36 - 40 = -4 < 0$, so there are no real solutions. The sign of a determines whether the parabola opens up or down, not whether it crosses the x-axis.*

7 *Use polynomial long division: $2x^2 \div 2x = x$, and $x(2x - 3) = 2x^2 - 3x$. Subtract to get $4x - 6$. Then $4x \div 2x = 2$, and $2(2x - 3) = 4x - 6$. The remainder is 0, so the quotient is $x + 2$.*

8 *Use the product property of radicals: $\sqrt{12} \cdot \sqrt{3} = \sqrt{12 \times 3} = \sqrt{36} = 6$.*

9 *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.*

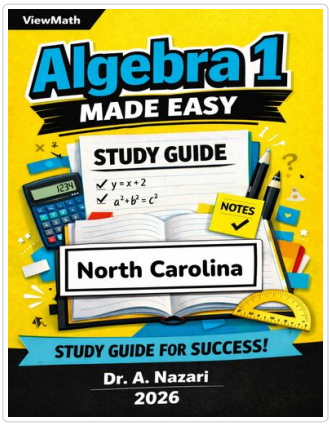
10 *Substitute $x = 10$ into the equation: $y = -1.5(10) + 40 = -15 + 40 = 25$.*

Well done checking your answers!

Keep practicing to strengthen your skills.

Great Job! Keep Learning with ViewMath!

*Keep up the great work! Visit **viewmath.com/NC-Algebra1** for free lessons, quizzes, and more.*



Study Guide

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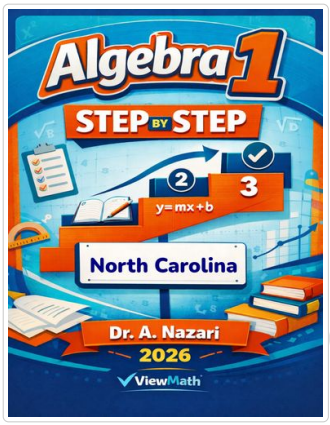

Step-by-Step

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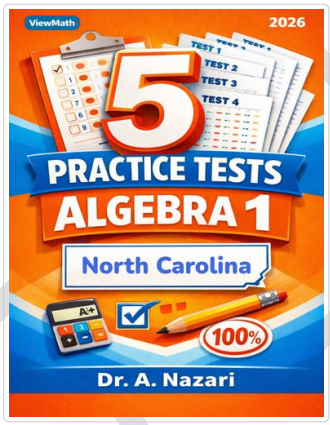

5 Practice Tests

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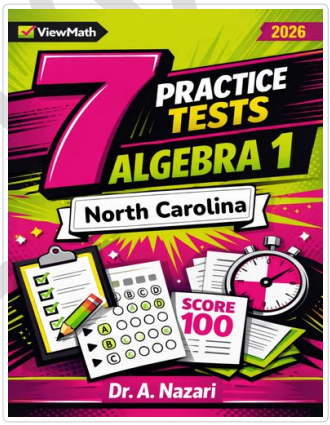

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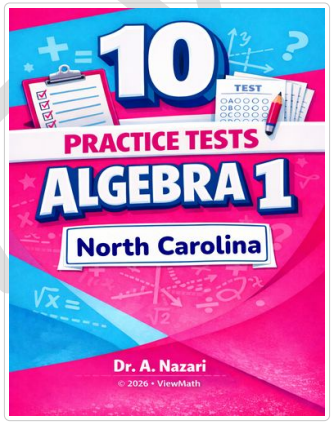

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