5 Pennsylvania Keystone Algebra I

Practice Tests

Algebra 1 Prep Made Simple with Clear, Step-by-Step Solutions







- Real Practice. Real Results
- Practice Smart. Score Higher.
- Small Steps, Big Gains!
- Practice
- Master
- Achieve

Reza Nazari

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Your Path to Success

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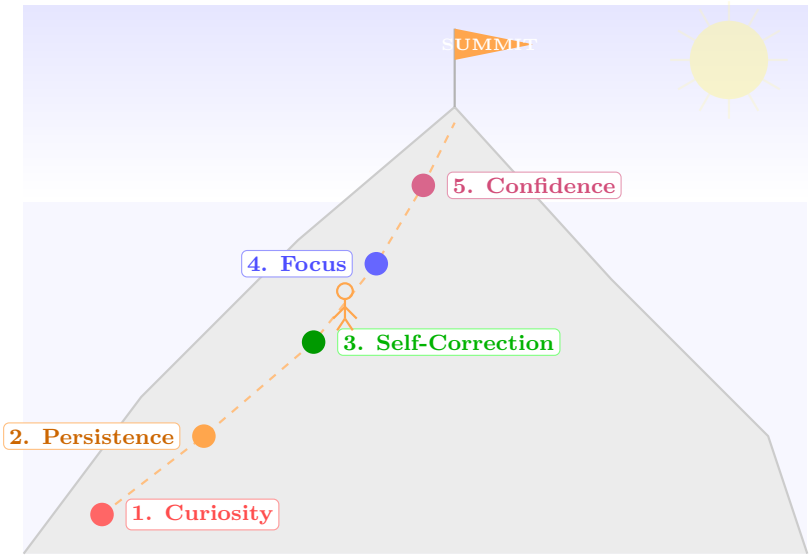
- For factoring and quadratic problems, multiply your factors back out to verify they produce the original expression. This thirty-second check catches sign errors and misplaced terms.

Clock Management

Divide the test mentally into thirds. After completing one-third of the items, glance at the clock to gauge your pace. If you have been spending more than two minutes on a single question, mark it, move forward, and return to it after you have collected every point you can from the remaining items. Many students lose points not because they lack knowledge, but because they run out of time on problems they *could* have solved.

Think Like an Algebraist

Five Habits That Separate Good from Great



Reframe Your Inner Dialogue

Instead of: "I will never understand quadratics."
Try: "I do not understand quadratics *yet*. What is the first step I can try?"

Neuroscience shows that when you treat a mistake as data rather than as a verdict, your brain literally rewires itself to perform better on the next attempt. Every error you analyze makes you measurably smarter.

The Five Habits of Successful Algebra Students

1. **Stay Curious:** Before you calculate, ask *why* the problem is set up the way it is. Why does the graph open downward? Why does the system have no solution? Curiosity transforms a tedious exercise into a puzzle worth solving. Students who ask "What would happen if I changed the coefficient?" consistently outperform those who simply follow memorized steps.

2. **Persist Through Difficulty:** Your brain strengthens its neural connections every time you wrestle with a hard problem—even if you do not solve it on the first try. Factoring a challenging trinomial, debugging a sign error in a system, or deciphering an unfamiliar function graph—these struggles are where the real learning occurs. Giving up after thirty seconds denies your brain the workout it needs.

3. **Correct Yourself Immediately:** When you review a missed problem, do not just read the solution. Rework it from scratch—without any hints—until you can complete it independently. That single act of self-correction is more valuable than getting ten routine problems right. Keep an "error journal" of the mistakes you catch, and review it before each practice test.

4. **Focus on One Problem at a Time:** On test day, the only equation that matters is the one in front of you. Do not replay the last question or worry about how many remain. Channel your full concentration into the present item, finish it cleanly, and then advance. Elite athletes call this "being in the zone"—and math students can train the same way.

5. **Build Confidence Through Evidence:** Each practice test you complete in this workbook is proof that you can handle Keystone-level Algebra I material. By the time you reach Test 5, you will have solved hundreds of problems across every domain—and that track record is the most powerful source of confidence there is. Trust the evidence, not the anxiety.

Algebra I Reference Materials

FACTORING

Perfect square trinomials	$a^2 + 2ab + b^2 = (a+b)^2$; $a^2 - 2ab + b^2 = (a-b)^2$
Difference of squares	$a^2 - b^2 = (a-b)(a+b)$

PROPERTIES OF EXPONENTS

Product of powers	$a^m \cdot a^n = a^{m+n}$
Quotient of powers	$\frac{a^m}{a^n} = a^{m-n}$
Power of a power	$(a^m)^n = a^{mn}$
Rational exponent	$a^{m/n} = \sqrt[n]{a^m}$
Negative exponent	$a^{-n} = \frac{1}{a^n}$

LINEAR EQUATIONS

Standard form	$Ax + By = C$
Slope-intercept form	$y = mx + b$
Point-slope form	$y - y_1 = m(x - x_1)$
Slope of a line	$m = \frac{y_2 - y_1}{x_2 - x_1}$
Direct variation	$y = kx$

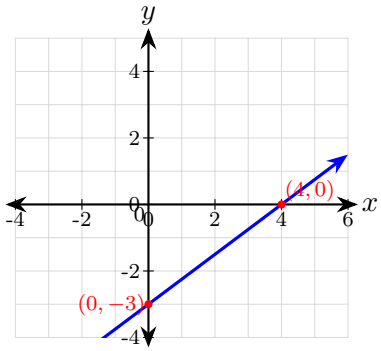
QUADRATIC EQUATIONS

Standard form	$f(x) = ax^2 + bx + c$
Vertex form	$f(x) = a(x-h)^2 + k$
Quadratic formula	$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$
Axis of symmetry	$x = -\frac{b}{2a}$

ADDITIONAL INFORMATION

Simple interest	$I = Prt$
Compound interest	$A = P(1+r)^t$
Arithmetic sequence	$a_n = a_1 + (n-1)d$
Geometric sequence	$a_n = a_1 \cdot r^{n-1}$

1) The graph shows a line.



What is the rate of change of the function shown?

☐ A. $\frac{4}{3}$
☐ B. $-\frac{4}{3}$
☐ C. $\frac{3}{4}$
☐ D. $-\frac{3}{4}$

2) Line m has equation $4x - 3y = 12$. Line n passes through $(6, 1)$ and is perpendicular to m. What is the y-intercept of line n?

☐ A. $\frac{11}{2}$
☐ B. $-\frac{7}{2}$
☐ C. $\frac{7}{2}$
☐ D. $-\frac{11}{2}$

3) What are the zeros of the quadratic equation $x^2 - x - 12 = 0$?

☐ A. -4 and 3
☐ B. -3 and 4
☐ C. -6 and 2
☐ D. -12 and 1

4) The feasible region for a system of inequalities has vertices at $(0, 0)$, $(0, 4)$, and $(3, 1)$. What is the maximum value of $x + y$ on the feasible region?

☐ A. 3
☐ B. 4
☐ C. 5
☐ D. 7

5) What is the domain of $f(x) = \dfrac{\sqrt{x+1}}{x-3}$?

☐ A. $x \geq -1$
☐ B. $x > -1,\ x \neq 3$
☐ C. $x \geq -1,\ x \neq 3$
☐ D. All real numbers except 3

6) A space probe transmits data at a rate of 2.5×10^6 bytes per second for 4×10^2 seconds. How many total bytes are transmitted?

☐ A. 1.0×10^8
☐ B. 1.0×10^9
☐ C. 6.5×10^8
☐ D. 1.0×10^{10}

7) Select ALL that apply. Which values are real zeros of $x^3 - 4x$?

☐ A. -2
☐ B. 0
☐ C. 2
☐ D. 4
☐ E. -4

8) For very large values of x, which function ultimately has the greater value?

☐ A. $f(x) = 100x + 5000$, since it starts larger
☐ B. $g(x) = (1.5)^x$ for all $x > 0$
☐ C. $f(x)$ initially, then $g(x)$ takes over
☐ D. They always increase at the same rate

9) A rental company charges a flat fee plus a per-day rate. The table shows the total cost for different rental periods.

Days	2	4	6	8
Cost ($)	90	150	210	270

Which equation models the total cost C for d days?

☐ A. $C = 30d$
☐ B. $C = 30d + 30$
☐ C. $C = 60d + 30$
☐ D. $C = 30d - 30$