$y = ax^2 + bx + c$

$(x+2)^2 = 16$

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

# 7 FULL-LENGTH




# MISSOURI Algebra II PRACTICE TESTS

Algebra 2 prep made simple with realistic practice, clear answer keys, and student-friendly step-by-step solutions



7 FULL-LENGTH PRACTICE TESTS

CLEAR ANSWER KEYS

STEP-BY-STEP SOLUTIONS

PRACTICE SMART. TEST CONFIDENTLY. SUCCEED.

7

# Missouri Algebra II EOC

## Algebra II

## Practice Tests

*Algebra 2 prep made simple with realistic practice, clear answer keys, and student-friendly step-by-step solutions.*

1 Baseline — 2 Repair — 3 Connect — 4 Stretch — 5 Stabilize — 6 Rehearse — 7 Finish

**Full Practice**

350 Algebra II questions across 7 complete tests.

**Standards First**

Missouri standards reference before the tests.

**Clear Review**

Answer keys and explanations built for correction.

**Test-Day Ready**

A longer path for pacing, stamina, and confidence.

Practice longer. Review smarter. Finish Algebra II stronger.

Reza Nazari

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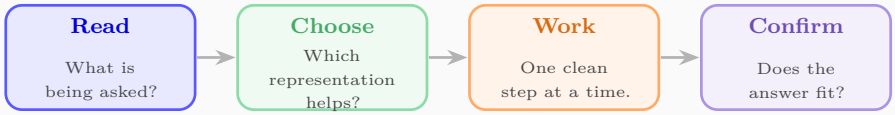
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# Advanced Algebra, Calm Thinking

What to do when a problem has more than one step

**Difficult questions become manageable when your process stays steady.**




By the time you reach a seven-test book, you are not just practicing content. You are practicing how to think when a question asks you to connect several ideas at once.

### When the problem includes a graph

Read the axes, scale, labels, intercepts, and direction before touching the choices. A graph often gives the answer's shape before it gives the answer's value.

### When the problem includes an equation

Identify the form first. Factored form points to zeros. Vertex form points to maximum or minimum. Standard form may need rewriting. Rational and radical equations may need restrictions checked.

### When the problem includes a context

Translate the story into variables, units, and a relationship. Then solve the mathematical question and return to the context so the final answer makes sense.

### When time feels tight

Protect the points you can earn. Finish accessible questions first, mark the heavy ones, and come back. A calm second look often solves what a rushed first look could not.

**Mindset that actually helps:** confidence is not pretending a hard problem is easy. Confidence is knowing you have a process even when the first step is not obvious.

## 1. FUNCTIONS, TRANSFORMATIONS, AND INVERSES

Composition: $(f \circ g)(x) = f(g(x))$

Inverse relationship: $f(g(x)) = x$ and $g(f(x)) = x$

Vertical shift: $f(x) + k$ moves up/down

Horizontal shift: $f(x - h)$ moves right by $h$

Average rate of change: $\dfrac{f(b) - f(a)}{b - a}$

Domain: allowed inputs

Range: possible outputs

## 2. QUADRATICS, POLYNOMIALS, AND COMPLEX NUMBERS

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

Vertex: $x = -\dfrac{b}{2a}$

Discriminant: $b^2 - 4ac$

Remainder theorem: remainder is $f(a)$ after division by $x - a$

Complex numbers: $i^2 = -1$

Conjugates: $(a + bi)(a - bi) = a^2 + b^2$

## 3. EXPONENTIALS, LOGARITHMS, AND SEQUENCES

Exponential model: $y = ab^x$

Log definition: $\log_b a = c \Leftrightarrow b^c = a$

Change of base: $\log_b a = \dfrac{\log a}{\log b}$

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

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

Finite geometric sum: $S_n = a_1 \dfrac{1 - r^n}{1 - r}$

## 4. TRIGONOMETRY, CONICS, AND STATISTICS

Identity: $\sin^2\theta + \cos^2\theta = 1$

Law of sines: $\dfrac{a}{\sin A} = \dfrac{b}{\sin B}$

Law of cosines: $c^2 = a^2 + b^2 - 2ab\cos C$

Circle: $(x - h)^2 + (y - k)^2 = r^2$

Mean: $\bar{x} = \dfrac{\sum x_i}{n}$

Standard deviation: spread around the mean

Normal curve: about $68\%, 95\%, 99.7\%$



Scan Me

# Algebra II Reference Materials

## QUADRATICS AND POLYNOMIALS

| | |
|---|---|
| Quadratic formula | $x = \dfrac{-b \pm \sqrt{b^2 - 4ac}}{2a}$ |
| Discriminant | $\Delta = b^2 - 4ac$ |
| Vertex of $ax^2 + bx + c$ | $x = -\dfrac{b}{2a}$ |
| Remainder theorem | $f(a)$ is the remainder after division by $x - a$ |
| Difference of squares | $a^2 - b^2 = (a - b)(a + b)$ |

## EXPONENTIALS AND LOGARITHMS

| | |
|---|---|
| Product rule | $\log_b(MN) = \log_b M + \log_b N$ |
| Quotient rule | $\log_b(M/N) = \log_b M - \log_b N$ |
| Power rule | $\log_b(M^p) = p \log_b M$ |
| Change of base | $\log_b a = \dfrac{\log a}{\log b}$ |
| Compound interest | $A = P(1 + r)^t$ |

## SEQUENCES, SERIES, AND COMPLEX NUMBERS

| | |
|---|---|
| Arithmetic sequence | $a_n = a_1 + (n - 1)d$ |
| Arithmetic series | $S_n = \dfrac{n}{2}(a_1 + a_n)$ |
| Geometric sequence | $a_n = a_1 r^{n-1}$ |
| Geometric series | $S_n = a_1 \dfrac{1 - r^n}{1 - r}$ |
| Imaginary unit | $i^2 = -1$ |

## TRIGONOMETRY AND CONICS

| | |
|---|---|
| Pythagorean identity | $\sin^2\theta + \cos^2\theta = 1$ |
| Law of sines | $\dfrac{a}{\sin A} = \dfrac{b}{\sin B} = \dfrac{c}{\sin C}$ |
| Law of cosines | $c^2 = a^2 + b^2 - 2ab\cos C$ |
| Circle | $(x - h)^2 + (y - k)^2 = r^2$ |
| Parabola | $(x - h)^2 = 4p(y - k)$ or $(y - k)^2 = 4p(x - h)$ |

## STATISTICS

| | |
|---|---|
| Mean | $\bar{x} = \dfrac{\sum x_i}{n}$ |
| Standard deviation idea | typical distance from the mean |
| Margin of error | critical value $\times$ standard error |
| Empirical rule | about $68\%, 95\%, 99.7\%$ within $1, 2, 3$ SDs |

1) Simplify $\frac{a^{-3}}{a^{-7}}$, assuming $a \neq 0$.

☐ A. $a^{10}$
☐ B. $a^{4}$
☐ C. $a^{-4}$
☐ D. $a^{-10}$

2) Simplify $x^{\frac{3}{4}} \cdot x^{\frac{1}{4}}$, assuming $x > 0$.

☐ A. $x^{\frac{3}{16}}$
☐ B. $x^{\frac{4}{8}}$
☐ C. $x^{2}$
☐ D. $x$

3) Which monic real polynomial of smallest degree has roots that include $x = 5$ and $x = 1 + 2i$?

☐ A. $x^3 - 7x^2 + 15x - 25$
☐ B. $x^3 - 7x^2 + 5x - 25$
☐ C. $x^2 - 6x + 5$
☐ D. $x^3 - 3x^2 - 5x + 25$

4) The graph of $f(x) = x^2 - 6x + 8$ crosses the $x$-axis at two points. Which points are they?

☐ A. $(0, 8)$ and $(6, 0)$
☐ B. $(-2, 0)$ and $(-4, 0)$
☐ C. $(2, 0)$ and $(4, 0)$
☐ D. $(3, -1)$

5) Solve $7 - 4x > 19$.

*Record your answer in the space provided.*

6) Simplify: $\frac{2}{3i} - \frac{1}{i}$.

☐ A. $-\frac{1}{3}i$
☐ B. $-\frac{5}{3}i$
☐ C. $\frac{1}{3}i$
☐ D. $\frac{5}{3}i$

7) Simplify: $(6 - 2i) - (3 + 5i) + (-4 + 7i)$.

☐ A. $-1 + 14i$
☐ B. $7 + 0i$
☐ C. $-1$
☐ D. $-1 - 14i$

8) The Remainder Theorem states that when a polynomial $f(x)$ is divided by $(x - c)$:

☐ A. The remainder equals 0 always.
☐ B. The quotient equals $f(c)$.
☐ C. The remainder equals $f(-c)$.
☐ D. The remainder equals $f(c)$.

9) What is the complete factorization of $6x^3 - 12x$ over the integers?

☐ A. $6x(x^2 - 2)$
☐ B. $6(x^3 - 2x)$
☐ C. $x(6x - 12)$
☐ D. $6x(x - 2)(x + 2)$

10) For $3x + 2y = 14$, what is the right side after multiplying the equation by 2?

*Record your answer in the space provided.*