Algebra 2
Full-Year Spiral Review
Bell Ringers

180 Daily Warm-Ups Aligned to CCSS

9 Monthly Themed Sets • 180 Days • 5–8 Minutes Daily

Premium TPT Resource • Grades 9–12

INCLUDES: Cover • TOC • Teacher Guide • Student Intro • CCSS Map • 180-Day Calendar • 180 Daily Bell Ringers • Detailed Solutions • Review Request

UM Printables • *Premium Educational Resources*

Teacher Implementation Guide

Why Spiral Review? The Research Base

Spiral review is grounded in over a century of cognitive science research on how human memory works. The cornerstone finding is the **spacing effect** (first documented by Ebbinghaus in 1885, validated by hundreds of subsequent studies): students retain information far longer when practice is distributed across multiple sessions rather than massed in a single block. A landmark 2008 study by Roediger and Karpicke published in *Psychological Science* demonstrated that retrieval practice — the act of recalling information from memory — produces 50%+ better long-term retention than rereading the same material. This resource is engineered around both principles: each daily bell ringer pulls forward a concept from a prior month (retrieval) and spreads practice for every standard across the full school year (spacing).

For Algebra 2 in particular, spiraling matters more than for almost any other math course. The Algebra 2 curriculum is dense with interconnected concepts — polynomials lead to rational functions, which lead to exponential and logarithmic functions, which depend on transformations first seen with quadratics. Without spaced retrieval, students forget January's polynomial factoring by the time they reach April's logarithmic equations. This resource combats that decay by ensuring every major Algebra 2 standard is revisited at least once per month after its introduction, often disguised as the 'spiral-back' problem you will see flagged with the circular arrow icon throughout.

The Daily 5–8 Minute Routine

Time	Phase	What Happens
0:00–1:00	Settle & Display	Project the day's bell ringer on the board. Students open to the matching day in their packet.
1:00–5:00	Independent Work	Students attempt all 3–4 problems silently. Resist helping too early — productive struggle is the point.
5:00–7:00	Pair Discussion	Pairs compare answers and reasoning. Students explain their thinking to each other — this is where the deepest learning happens.
7:00–8:00	Whole-Class Debrief	Cold-call on 2–3 students to share solutions. Address misconceptions. Project the worked solution if needed.

How to Use the Embedded Features

Each bell ringer in this resource carries intentional design features rooted in research on cognition and motivation. Understanding what each icon and tag means will help you leverage the resource to its full potential.

CCSS Tag (Top Right). Every problem set is tagged with its primary Common Core State Standard (e.g., HSA-REI.B.4). Use these to align instruction with your district pacing guide, document standard coverage for evaluations, and identify which bell ringers to pull when reteaching a specific standard.

Spiral Icon (Circular Arrow). Flags problems that intentionally retrieve a concept from a prior month. These are the most important problems in the packet — they are where long-term memory is built. If you are short on time, prioritize the spiral problems over the new-concept problems.

Student Introduction

Welcome to Your Daily Algebra 2 Warm-Up!

Every school day for the next 180 days, you will start class with a short set of 3–4 problems designed to take 5–8 minutes. This daily warm-up is not busywork — it is one of the most powerful learning tools in mathematics. Each problem has been carefully chosen to either practice a new skill you are learning this month or to pull forward a skill you learned in a previous month. By the end of the year, you will have seen every major Algebra 2 concept dozens of times, in different contexts, with different twists. That repetition is how memories become permanent.

You will notice that many problems have small icons next to them. These icons are not just decoration — they are signals about what kind of thinking the problem requires. Use this guide to decode them.

How to Read the Icons

Spiral (circular arrow). This is a SPIRAL-BACK problem — it brings back something you learned in a previous month. Treat these as 'memory checks.' If you get stuck, flip back to the month where the concept was first introduced. The point is to retrieve the skill from your own memory, not to look it up immediately.

Globe. This is a REAL-WORLD problem — it asks you to apply math to a context like money, motion, populations, or geometry. Read carefully: real-world problems often have a setup sentence that contains the key information. Write down what the variables represent before you start calculating.

Lightbulb. This is an EXPLAIN-WHY problem — it asks you to justify or analyze, not just compute. Take these seriously. The ability to explain why a method works is the difference between memorizing math and understanding math. Always write your answer in complete sentences.

X (in a circle). This is an ERROR-ANALYSIS problem — it shows you a fictional student's incorrect work and asks you to find the mistake. This is harder than solving a problem yourself because you have to understand both the right way AND the wrong way. Be specific about what went wrong — not just 'they made an error,' but exactly which step and why.

The Weekly Self-Assessment Rubric

Every fifth day (Days 5, 10, 15, 20 of each month), you will see a small self-assessment box at the bottom of the page. After you finish the day's problems, take 30 seconds to rate your confidence on a 1–4 scale. Be honest — this is for YOU, not for a grade. The scale is:

1	Lost — I couldn't start most problems without help
2	Shaky — I can do parts but need reminders or examples
3	Solid — I can do most problems independently with occasional checks
4	Mastered — I could teach this to a classmate

A Growth Mindset Reminder

CCSS Standards Coverage Map

This map shows which Common Core State Standards are introduced and spiraled back throughout the 180-day resource. The first month listed is the introduction; subsequent months indicate spiraled retrieval practice. Use this map to document standard coverage for evaluations and to identify which bell ringers to pull when reteaching a specific standard.

Standard Code	Description	Months Active
HSA-REI.B.3	Solve linear equations & inequalities in one variable	1, 2 (spiral)
HSA-REI.B.4	Solve quadratic equations by inspection, factoring, completing the square, formula	1, 3, 4 (spiral)
HSA-REI.C.6	Solve systems of linear equations exactly and approximately	1, 2 (spiral)
HSA-REI.C.7	Solve systems of equations including a quadratic	3, 4 (spiral)
HSA-REI.D.7	Solve rational & quadratic inequalities	3, 6 (spiral)
HSA-CED.A.1	Create equations in one variable	1, 3, 4, 5, 6, 7, 9
HSA-CED.A.2	Create equations in two variables	1, 2, 3
HSA-CED.A.3	Represent constraints with equations & solve	1, 6
HSA-SSE.A.1	Interpret parts of expressions	1, 4
HSA-SSE.A.2	Use structure to factor polynomials	1, 4, 5
HSA-SSE.B.3	Factor to reveal zeros; complete the square	1, 3, 4
HSA-SSE.B.4	Derive & use formulas for geometric series	9
HSA-APR.A.1	Understand polynomials form a system analogous to integers	1, 4
HSA-APR.B.2	Remainder & Factor Theorems	4, 5
HSA-APR.B.3	Identify zeros; sketch graphs of polynomial functions	4, 5, 6 (spiral)
HSA-APR.C.4	Prove polynomial identities	5
HSA-APR.C.5	Binomial Theorem	4
HSA-APR.D.6	Rewrite rational expressions; long division	6
HSF-IF.A.1	Understand function notation & domain/range	2
HSF-IF.A.2	Use function notation; evaluate functions	2
HSF-IF.B.4	Interpret key features of graphs	2, 3, 5, 7
HSF-IF.B.5	Relate domain to graph; quantitative relationships	2
HSF-IF.B.6	Calculate & interpret average rate of change	1, 2, 3
HSF-IF.C.7	Graph functions (linear, quadratic, polynomial, rational, exp/log, trig)	1–9
HSF-IF.C.8	Write functions in different forms (vertex form)	3
HSF-IF.C.9	Compare properties of two functions	2, 3

180-Day Pacing Calendar

This at-a-glance calendar shows the topic for each of the 180 daily bell ringers, organized by month. Use it to plan your weekly instruction and identify which days align with your curriculum's pacing.

Month 1: Algebra 1 Essentials

Review of linear equations, systems, and factoring

Day	Topic	CCSS
1	Solving Linear Equations	HSA-REI.B.3
2	Multi-Step Linear Equations	HSA-REI.B.3
3	Linear Inequalities	HSA-REI.B.3
4	Slope & Rate of Change	HSF-IF.B.6
5	Writing Linear Equations	HSA-CED.A.2
6	Systems by Substitution	HSA-REI.C.6
7	Systems by Elimination	HSA-REI.C.6
8	Systems Word Problems	HSA-CED.A.3
9	Compound Inequalities	HSA-REI.B.3
10	Absolute Value Equations	HSA-REI.B.3
11	Exponent Rules	HSA-SSE.B.3
12	Polynomial Operations	HSA-APR.A.1
13	Factoring GCF & Grouping	HSA-SSE.A.1
14	Factoring Trinomials x^2+bx+c	HSA-SSE.A.2
15	Factoring Trinomials ax^2+bx+c	HSA-SSE.A.2
16	Special Factoring Patterns	HSA-SSE.A.2
17	Solving Quadratics by Factoring	HSA-REI.B.4
18	Mixed Algebra 1 Review	Mixed
19	Error Analysis & Justification	HSA-REI.A.1
20	Month 1 Cumulative Review	Mixed

Month 2: Function Families & Transformations

Function notation, parent functions, transformations, piecewise

Day	Topic	CCSS
21	Function Notation & Evaluation	HSF-IF.A.2
22	Domain & Range	HSF-IF.A.1, HSF-IF.B.5
23	Parent Functions	HSF-IF.C.7
24	Vertical & Horizontal Translations	HSF-BF.B.3

MONTH 01

Algebra 1 Essentials

Review of linear equations, systems, and factoring

CCSS CLUSTERS

HSA-REI.B, HSA-REI.C, HSA-CED.A, HSA-SSE.A, HSA-APR.A

§ Key Vocabulary

Terms students will encounter throughout this month's bell ringers

Linear equation	An equation whose graph is a straight line; highest power of the variable is 1.
Slope	The ratio of vertical change to horizontal change: m = (y2 - y1)/(x2 - x1).
System of equations	A set of two or more equations with the same variables.
Substitution	Solving one equation for a variable and substituting into the other.
Elimination	Adding or subtracting equations to remove a variable.
Factoring	Rewriting a polynomial as a product of simpler polynomials.
Zero product property	If ab = 0 then a = 0 or b = 0.

DAY 1

Solving Linear Equations

Month 1 • Algebra 2 Spiral Review

1

CCSS: HSA-REI.B.3 | REAL-WORLD

1. Solve for x: 3x + 7 = 22
   — *procedural*

2. Solve for y: 2(y - 5) = 3y + 1
   — *procedural*

3. Solve: (x + 4)/3 = 2x - 5
   — *procedural*

4. A taxi charges $3.50 plus $2.25 per mile. If a fare was $19.25, how many miles was the ride?
   — *application*

DAY 2

Multi-Step Linear Equations

Month 1 • Algebra 2 Spiral Review

2

CCSS: HSA-REI.B.3 | SPIRAL-BACK

1. Solve: 4(2x - 3) - 5x = 2x + 9
   — *procedural*

2. Solve: 5 - 3(2x - 1) = 2(4 - x)
   — *procedural*

3. Solve for the indicated variable: A = P + Prt, solve for r.
   — *conceptual*

4. Yesterday you solved 3x + 7 = 22. Today write a real-world scenario that this equation could represent.
   — *spiral*

DAY 13

Factoring GCF & Grouping

13

Month 1 • Algebra 2 Spiral Review

CCSS: HSA-SSE.A.1 | SPIRAL-BACK

1. Factor out the GCF: $12x^3 + 18x^2 - 6x$
   — *procedural*

2. Factor by grouping: $2x^3 + 4x^2 + 3x + 6$
   — *procedural*

3. Factor: $6x^2 y - 9xy^2 + 3xy$
   — *procedural*

4. Factor completely: $4x^3 - 12x^2 + 8x$
   — *procedural*

DAY 14

Factoring Trinomials x^2+bx+c

14

Month 1 • Algebra 2 Spiral Review

CCSS: HSA-SSE.A.2 | SPIRAL-BACK

1. Factor: $x^2 + 7x + 12$
   — *procedural*

2. Factor: $x^2 - 9x + 20$
   — *procedural*

3. Factor: $x^2 + 2x - 15$
   — *procedural*

4. Factor: $x^2 - 11x + 28$
   — *procedural*

Day 6 — Systems by Substitution

Problem 1. ***Procedural***

Solve by substitution: y = 2x; x + y = 9

Solution:

Substitute y = 2x into x + y = 9: x + 2x = 9 → 3x = 9 → x = 3. Then y = 2(3) = 6. Solution: (3, 6). Check in second equation: 3 + 6 = 9. Correct.

Problem 2. ***Procedural***

Solve by substitution: y = x + 3; 2x + 3y = 19

Solution:

Substitute y = x + 3 into 2x + 3y = 19: 2x + 3(x + 3) = 19 → 2x + 3x + 9 = 19 → 5x = 10 → x = 2. Then y = 2 + 3 = 5. Solution: (2, 5). Check: 2(2) + 3(5) = 4 + 15 = 19. Correct.

Problem 3. ***Procedural***

Solve: 3x - y = 7; y = 2x - 5

Solution:

Substitute y = 2x - 5 into 3x - y = 7: 3x - (2x - 5) = 7 → 3x - 2x + 5 = 7 → x + 5 = 7 → x = 2. Then y = 2(2) - 5 = -1. Solution: (2, -1). Check: 3(2) - (-1) = 6 + 1 = 7. Correct.

Problem 4. ***Spiral***

Yesterday you found the equation y = -2x + 13. Find where this line intersects y = x + 5.

Solution:

Set -2x + 13 = x + 5. Subtract x: -3x + 13 = 5. Subtract 13: -3x = -8. Divide: x = 8/3. Then y = 8/3 + 5 = 8/3 + 15/3 = 23/3. Intersection point: (8/3, 23/3).

Day 7 — Systems by Elimination

Problem 1. ***Procedural***

Solve by elimination: 2x + 3y = 12; 2x - 3y = 0

Solution:

Add the equations: (2x + 3y) + (2x - 3y) = 12 + 0 → 4x = 12 → x = 3. Substitute back: 2(3) + 3y = 12 → 6 + 3y = 12 → 3y = 6 → y = 2. Solution: (3, 2).

Problem 2. ***Procedural***

Solve by elimination: 3x + 2y = 11; x - 2y = -1

Solution:

Add the equations (y terms cancel): (3x + 2y) + (x - 2y) = 11 + (-1) → 4x = 10 → x = 2.5. Substitute back: 2.5 - 2y = -1 → -2y = -3.5 → y = 1.75. Solution: (2.5, 1.75) or (5/2, 7/4).

Problem 3. ***Procedural***

Solve by elimination: 4x + 5y = 2; 3x - 2y = -7

Solution:

Day 51 — Systems with Quadratics

Problem 1. ***Procedural***

Solve the system: $y = x^2$; $y = x + 2$

Solution:

Set equal: $x^2 = x + 2 \rightarrow x^2 - x - 2 = 0$. Factor: $(x - 2)(x + 1) = 0$. $x = 2$ or $x = -1$. For $x = 2$: $y = 4$ (or $2 + 2 = 4$). For $x = -1$: $y = 1$ (or $-1 + 2 = 1$). Solutions: $(2, 4)$ and $(-1, 1)$.

Problem 2. ***Procedural***

Solve: $y = x^2 - 4x + 5$; $y = 2x - 1$

Solution:

Set equal: $x^2 - 4x + 5 = 2x - 1 \rightarrow x^2 - 6x + 6 = 0$. Use quadratic formula: $D = 36 - 24 = 12 = 4*3$, so $\sqrt{(D)} = 2\sqrt{(3)}$. $x = (6 \pm 2\sqrt{(3)})/2 = 3 \pm \sqrt{(3)}$. For $x = 3 + \sqrt{(3)}$: $y = 2(3 + \sqrt{(3)}) - 1 = 5 + 2\sqrt{(3)}$. For $x = 3 - \sqrt{(3)}$: $y = 5 - 2\sqrt{(3)}$. Solutions: $(3 + \sqrt{(3)}, 5 + 2\sqrt{(3)})$ and $(3 - \sqrt{(3)}, 5 - 2\sqrt{(3)})$.

Problem 3. ***Procedural***

Find where the line $y = 3$ intersects $y = x^2 - 2x - 3$.

Solution:

Set $3 = x^2 - 2x - 3 \rightarrow x^2 - 2x - 6 = 0$. Quadratic formula: $D = 4 + 24 = 28 = 4*7$, so $\sqrt{(D)} = 2\sqrt{(7)}$. $x = (2 \pm 2\sqrt{(7)})/2 = 1 \pm \sqrt{(7)}$. Intersection points: $(1 + \sqrt{(7)}, 3)$ and $(1 - \sqrt{(7)}, 3)$.

Problem 4. ***Conceptual***

A system $y = x^2 + 1$ and $y = -x^2 - 1$ has no solution. Explain why graphically.

Solution:

The first parabola $y = x^2 + 1$ opens upward with vertex at $(0, 1)$ — so y is always ≥ 1. The second parabola $y = -x^2 - 1$ opens downward with vertex at $(0, -1)$ — so y is always ≤ -1. Since one is always ≥ 1 and the other is always ≤ -1, they can never share a point. Graphically, the upward-opening parabola is entirely above $y = 1$, while the downward-opening parabola is entirely below $y = -1$, with the band $-1 < y < 1$ (containing the line $y = 0$) separating them.

Day 52 — Comparing Linear vs Quadratic Models

Problem 1. ***Procedural***

Compare $f(x) = 3x + 5$ and $g(x) = x^2$. Find where they intersect.

Solution:

Set equal: $x^2 = 3x + 5 \rightarrow x^2 - 3x - 5 = 0$. Quadratic formula: $D = 9 + 20 = 29$. $x = (3 \pm \sqrt{(29)})/2$. Approximate: $\sqrt{(29)} \approx 5.39$, so $x \approx 4.19$ or $x \approx -1.19$. Intersection points: about $(4.19, 17.58)$ and $(-1.19, 1.42)$.

Problem 2. ***Conceptual***

Which grows faster for large x: $y = 100x$ or $y = x^2$?

Solution:

For large x, $y = x^2$ grows faster. Although $y = 100x$ is larger when x is small (e.g., at $x = 10$, $100x = 1000$ vs $x^2 = 100$), the quadratic eventually overtakes it. At $x = 100$, $100x = 10000$ but $x^2 = 10000$. At $x = 200$, $100x = 20000$ but $x^2 = 40000$. From $x = 100$ onward, x^2 dominates. Any polynomial of higher degree eventually grows faster than a lower-degree polynomial.

Problem 3. ***Application***

MONTH 05

Polynomial Roots & End Behavior

Rational root theorem, fundamental theorem of algebra, sketching polynomial graphs

CCSS CLUSTERS
HSA-APR.B, HSA-APR.C, HSF-IF.C.7, HSA-REI.D

§ Key Vocabulary

Terms students will encounter throughout this month's bell ringers

Root / Zero	A value of x for which P(x) = 0; also an x-intercept of the graph.
Multiplicity	The number of times a factor appears in a polynomial.
Rational root theorem	Possible rational roots = (factors of constant term) / (factors of leading coefficient).
Fundamental theorem of algebra	A polynomial of degree n has exactly n complex roots (counting multiplicity).
End behavior	How the y-values behave as x approaches +∞ or -∞.
Turning point	A point where the graph changes from increasing to decreasing or vice versa.

DAY 143

Unit Circle Values

143

Month 8 • Algebra 2 Spiral Review

CCSS: HSF-TF.A.2 | SPIRAL-BACK

1. Find sin(π/3) and cos(π/3).
   — *procedural*

2. Find tan(π/4) and tan(5π/6).
   — *procedural*

3. Find sin(3π/2) and cos(π).
   — *procedural*

4. Find all six trig values for the angle 5π/3.
   — *procedural*

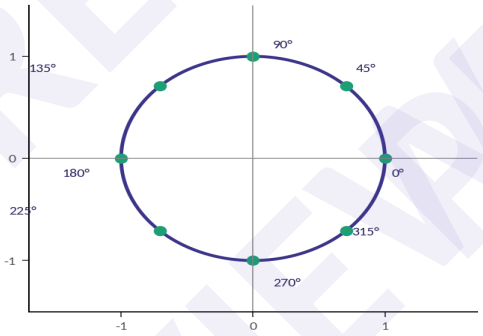

Figure: Reference diagram for Day 143.

DAY 144

Trig Ratios in Right Triangles

144

Month 8 • Algebra 2 Spiral Review

CCSS: HSF-TF.C.8 | SPIRAL-BACK | REAL-WORLD

1. In a right triangle with legs 3 and 4, find sin, cos, tan of the angle opposite the side of length 3.
   — *procedural*

2. A right triangle has hypotenuse 13 and one leg 5. Find the six trig ratios for the angle opposite the side 5.
   — *procedural*

3. Find sin(θ) if cos(θ) = 3/5 and θ is in Quadrant I.
   — *procedural*

4. A ladder 10 ft long makes a 60° angle with the ground. How high up the wall does it reach?
   — *application*

MONTH 09

Sequences, Series & Statistics

Arithmetic & geometric sequences, sigma notation, descriptive statistics

CCSS CLUSTERS

HSF-BF.A.2, HSA-SSE.B.4, HSS-ID.A.2, HSS-ID.A.4, HSS-ID.B.6, HSS-ID.C.9

§ Key Vocabulary

Terms students will encounter throughout this month's bell ringers

Arithmetic sequence	A sequence with a constant difference between consecutive terms: a_n = a_1 + (n - 1)d.
Geometric sequence	A sequence with a constant ratio between consecutive terms: a_n = a_1 * $r^{(n - 1)}$.
Common difference	The constant d added to each term of an arithmetic sequence to get the next term.
Common ratio	The constant r multiplied by each term of a geometric sequence to get the next term.
Series	The ∑ of the terms of a sequence.
Sigma notation	Compact notation for a ∑ using the Greek letter σ (Σ).
Standard deviation	A measure of how spread out data values are from the mean; sqrt of variance.
Z-score	The number of standard deviations a data value is from the mean: z = (x - mean)/SD.

FULL RESOURCE OVERVIEW

What's Inside

180 daily Algebra 2 bell ringers — 9 monthly themed sets

180	720	9	258
DAILY BELL RINGERS	PROBLEMS + SOLUTIONS	MONTHLY THEMED SETS	TOTAL PAGES

9 Monthly Themed Sets

Each month = 20 bell ringers + detailed solutions + key vocabulary

MONTH 1
Algebra 1 Essentials
Linear eq, systems, factoring

MONTH 2
Function Families
Transformations, piecewise

MONTH 3
Quadratic Functions
Vertex form, quadratic formula

MONTH 4
Polynomial Operations
Factoring, division, cubes

MONTH 5
Polynomial Roots
Rational root theorem, FTA

MONTH 6
Rational Functions
Asymptotes, operations, equations

MONTH 7
Exponential & Log
Properties, growth, compound interest

MONTH 8
Trigonometry Intro
Unit circle, graphs, identities

MONTH 9
Sequences & Stats
Series, sigma, normal distribution

Premium Features

- **CCSS-Aligned**
  Every problem tagged to a Common Core standard
- **Spiral Review**
  Each day includes a retrieval-practice problem
- **Detailed Solutions**
  Step-by-step worked solutions for all 720 problems
- **Real-World Tasks**
  Application problems marked with a globe icon
- **Error Analysis**
  Weekly 'find the mistake' problems build metacognition
- **Self-Assessment**
  End-of-week rubric on Days 5, 10, 15, 20