



East Rankin Academy

Algebra I – Scope & Sequence
(Prentice Hall, ISBN 013052316X)

Unit / Chapter	Key Topics	Suggested Timeframe
1. Foundations of Algebra	Variables, expressions, order of operations, properties of numbers, simple equations, basic problem solving.	3–4 weeks
2. Solving Equations	One-step, two-step, multi-step equations; variables on both sides; ratios, proportions; absolute value equations.	2–3 weeks
3. Solving Inequalities	Graphing inequalities on number lines; compound inequalities; absolute value inequalities; applications.	2 weeks
4. Introduction to Functions	Relations & functions; domain & range; function notation; graphing linear functions.	2 weeks
5. Linear Functions	Slope, rate of change; graphing using slope-intercept & point-slope forms; writing linear equations; parallel & perpendicular lines.	3 weeks
6. Systems of Equations & Inequalities	Graphing, substitution, elimination; systems of inequalities; linear programming.	2–3 weeks
7. Polynomials & Factoring	Adding, subtracting, multiplying polynomials; special products; factoring trinomials & differences of squares; solving by factoring.	3 weeks
8. Quadratic Functions & Equations	Graphing parabolas; solving quadratics by factoring, completing the square, quadratic formula; complex solutions.	3–4 weeks
9. Exponents & Exponential Functions	Laws of exponents; scientific notation; exponential growth & decay.	2 weeks
10. Radical Expressions & Equations	Simplifying radicals; operations; solving radical equations.	1–2 weeks
11. Rational Expressions & Equations	Simplifying rational expressions; multiplying/dividing/adding/subtracting; solving rational equations.	2 weeks
12. Data Analysis & Probability	Measures of central tendency; interpreting graphs; basic probability; permutations & combinations.	1–2 weeks



East Rankin Academy

Geometry – Scope & Sequence
(Prentice Hall, ISBN 9780133659481)

Unit / Chapter	Key Topics	Suggested Timeframe
1. Tools of Geometry	Points, lines, planes; measuring segments & angles; angle relationships; distance & midpoint; basic constructions; perimeter, circumference, area overview.	3–4 weeks
2. Reasoning & Proof	Patterns & inductive reasoning; conditional statements; definitions & biconditionals; deductive reasoning; writing formal proofs.	2–3 weeks
3. Parallel & Perpendicular Lines	Properties of parallel lines; proving lines parallel; slopes & equations of lines; perpendicular lines; coordinate geometry applications.	2–3 weeks
4. Congruent Triangles	Triangle congruence (SSS, SAS, ASA, AAS); CPCTC; isosceles & equilateral triangles; right-triangle congruence; overlapping triangles.	3 weeks
5. Relationships Within Triangles	Medians, altitudes, perpendicular & angle bisectors; triangle inequality; indirect proofs; inequalities in one triangle & between two triangles.	2–3 weeks
6. Quadrilaterals & Polygons	Angle-sum theorems; properties of parallelograms and special quadrilaterals (rhombus, rectangle, square, trapezoid, kite); coordinate proofs.	2–3 weeks
7. Similarity	Similar polygons; ratios & proportions; dilations; similarity in right triangles; effects on perimeters & areas.	2–3 weeks
8. Right Triangles & Trigonometry	Pythagorean theorem & converse; special right triangles; basic trigonometric ratios; solving right triangles; applications.	2–3 weeks
9. Transformations	Translations, reflections, rotations, compositions; symmetry; dilations revisited in coordinate plane.	1–2 weeks
10. Area of Polygons & Circles	Area formulas for triangles, quadrilaterals, regular polygons, circles, and sectors; applications & problem solving.	1–2 weeks
11. Surface Area & Volume of Solids	Prisms, cylinders, pyramids, cones, spheres—surface area & volume formulas; real-world applications.	2 weeks
12. Circles	Arcs, chords, inscribed angles, tangents, segment lengths; circle equations in the coordinate plane.	2–3 weeks



East Rankin Academy

Algebra II – Scope & Sequence
(Prentice Hall, ISBN 9780133659498)

Unit / Chapter	Key Topics	Suggested Timeline
1. Foundations / Tools of Algebra II	Real numbers & properties; algebraic expressions; solving equations & inequalities; absolute value; function basics; domain/range	3–4 weeks
2. Functions, Equations, & Graphs	Linear functions & models; absolute value functions; piecewise functions; transformations; evaluating, composing, inverting functions	2–3 weeks
3. Systems of Equations & Inequalities	Solving linear systems; systems with 3 variables; inequalities & linear programming; solution sets & graphs	2–3 weeks
4. Matrices	Matrices operations; determinants; inverse matrices; solving systems via matrices	1–2 weeks
5. Quadratic Equations and Functions	Quadratic functions; factoring; completing the square; quadratic formula; complex roots; graphs of parabolas	2–3 weeks
6. Polynomials & Polynomial Functions	Polynomial operations; polynomial division; zeros & factors; Fundamental Theorem of Algebra; behavior of polynomial graphs	2–3 weeks
7. Radical & Rational Exponents	Radical expressions; rational exponents; simplifying; solving radical equations; graphing radical/rational functions	2–3 weeks
8. Exponential & Logarithmic Functions	Exponential growth/decay; logarithms; laws of logs; solving exponential & log equations; applications	2–3 weeks
9. Rational Functions	Rational expressions; operations & simplifications; graphing rational functions; asymptotes & holes; solving rational equations	2 weeks
10. Conic Sections / Quadratic Relations	Parabolas, ellipses, hyperbolas & circles; translations; standard equations; properties of conics	1–2 weeks
11. Sequences & Series	Arithmetic sequences & series; geometric sequences & series; sum formulas; sigma notation; possibly binomial theorem / Pascal's triangle	1–2 weeks

12. Probability & Statistics	Probability (conditional, compound); statistical distributions; interpreting data; normal distribution; sample vs population; standard deviation	1–2 weeks
13. Trigonometry / Periodic Functions	Unit circle; radians; trig functions (sine, cosine, tangent, etc.); graphs of trig functions; reciprocal functions; identities & equations; Law of Sines/Cosines	2–3 weeks

Total pacing ≈ 36 weeks. Adjust for testing windows and school calendar.



East Rankin Academy

Algebra & Trigonometry for College Readiness – Scope & Sequence
(Prentice Hall, ISBN 0131366262)

Unit / Chapter	Key Topics	Suggested Timeframe
1. Foundations / Review of Functions	Sets & real numbers; operations on real numbers; linear equations & inequalities; function notation; domain & range; transformations; combinations & composition; inverse functions.	2–3 weeks
2. Polynomial & Rational Functions	Polynomial division; zeros and theorems; graph behavior; rational functions, asymptotes & holes; partial fractions.	3 weeks
3. Exponential & Logarithmic Functions	Exponential growth/decay; properties of logarithms; solving exponential & logarithmic equations; applications.	2–3 weeks
4. Trigonometric Functions	Radian measure; unit circle; right triangle trig; graphs of sine, cosine, tangent & reciprocal functions; amplitude, period, phase shift.	3–4 weeks
5. Trigonometric Identities & Equations	Fundamental identities; verifying identities; solving trig equations; sum & difference formulas; multiple-angle formulas.	2–3 weeks
6. Applications of Trigonometry	Law of Sines & Cosines; vectors & dot product; polar coordinates; complex numbers in polar form; De Moivre's Theorem.	2–3 weeks
7. Systems of Equations & Matrices	Linear & nonlinear systems; matrices & determinants; Cramer's Rule.	2 weeks
8. Analytic Geometry (Conics)	Parabolas, ellipses, hyperbolas; translations & rotations; parametric equations.	2 weeks
9. Sequences, Series & Probability	Arithmetic & geometric sequences/series; sigma notation; binomial theorem; probability basics.	2 weeks
10. Limits & Introduction to Calculus	Informal limits; continuity; tangent lines; derivative concept & basic applications.	2 weeks
11. Optional / Enrichment Topics	Additional modeling projects or advanced applications as time permits.	1–2 weeks



East Rankin Academy

Pre-Calculus – Scope & Sequence
(Prentice Hall, ISBN 9780134586588)

Unit / Chapter	Key Topics	Suggested Timeframe
1. Foundations / Functions Review	Sets, real/complex numbers; function notation; domain & range; transformations; combinations & composition; inverse functions.	2–3 weeks
2. Polynomial & Rational Functions	Polynomial division; zeros and theorems; graph behavior; rational functions, asymptotes & holes.	3 weeks
3. Exponential & Logarithmic Functions	Exponential growth/decay; properties of logs; solving exponential & logarithmic equations; applications.	2–3 weeks
4. Trigonometric Functions	Radian measure; unit circle; right triangle trig; graphs of sine, cosine, tangent & reciprocal functions; amplitude, period, phase shift.	3–4 weeks
5. Trigonometric Identities & Equations	Fundamental identities; verifying identities; solving trig equations; sum & difference formulas; multiple-angle formulas.	2–3 weeks
6. Applications of Trigonometry	Law of Sines & Cosines; vectors & dot product; polar coordinates; complex numbers in polar form; De Moivre's Theorem.	2–3 weeks
7. Systems of Equations & Matrices	Linear & nonlinear systems; partial fractions; matrices & determinants; Cramer's Rule.	2 weeks
8. Analytic Geometry (Conics)	Parabolas, ellipses, hyperbolas; translations & rotations; parametric equations.	2 weeks
9. Sequences, Series & Probability	Arithmetic & geometric sequences/series; sigma notation; binomial theorem; probability basics.	2 weeks
10. Limits & Introduction to Calculus	Informal limits; continuity; tangent lines; derivative concept & basic applications.	2 weeks
11. Optional / Enrichment Topics	Vectors in 3-D; polar equations of conics; additional modeling projects as time permits.	1–2 weeks



East Rankin Academy

Senior Algebra – Scope & Sequence
(College Algebra, ISBN 0495558885)

Unit / Chapter	Key Topics	Suggested Timeframe
1. Fundamentals of Algebra	Review of real numbers; exponents and radicals; algebraic expressions; linear equations & inequalities; absolute value; problem solving.	2–3 weeks
2. Functions & Graphs	Function notation; domain & range; transformations; combinations & composition; inverse functions; graphing basics.	3 weeks
3. Polynomial & Rational Functions	Polynomial division; zeros of polynomials; Fundamental Theorem of Algebra; graph behavior; rational functions and asymptotes.	3–4 weeks
4. Exponential & Logarithmic Functions	Exponential growth/decay; properties of logarithms; solving exponential & log equations; applications.	2–3 weeks
5. Systems of Equations & Inequalities	Solving systems of linear equations (substitution, elimination, matrices); systems of inequalities; linear programming.	2–3 weeks
6. Matrices & Determinants	Matrix operations; inverses; determinants; Cramer's Rule; applications to systems of equations.	2 weeks
7. Sequences, Series & Probability	Arithmetic & geometric sequences and series; sigma notation; binomial theorem; basic probability.	2–3 weeks
8. Conic Sections & Analytic Geometry	Circles, ellipses, parabolas, hyperbolas; graphing; parametric equations.	2 weeks
9. Additional Topics (as time permits)	Topics such as piecewise modeling, nonlinear systems, or an introduction to limits, depending on local goals.	1–2 weeks

Total pacing = 36 weeks. Adjust for testing windows and school calendar.



East Rankin Academy

Calculus – Scope & Sequence
(Stewart Calculus: Early Transcendentals, ISBN 9781337613927)

Unit / Chapter	Key Topics	Suggested Timeframe
1. Functions & Models	Review of functions; new functions; shifting & scaling; trigonometric, exponential, and logarithmic models.	1–2 weeks
2. Limits & Continuity	Tangent and velocity problems; limit laws; precise definition of a limit; one-sided limits; continuity; infinite limits.	2–3 weeks
3. Derivatives	Definition of derivative; differentiation rules (power, product, quotient, chain); derivatives of trig, exponential & log functions; implicit differentiation; related rates.	3–4 weeks
4. Applications of Derivatives	Extrema; Mean Value Theorem; curve sketching; optimization; linear approximation & differentials; L'Hospital's Rule; motion; Newton's method.	3–4 weeks
5. Integrals	Antiderivatives; Riemann sums; definite integrals; Fundamental Theorem of Calculus; substitution rule.	3–4 weeks
6. Applications of Integration	Areas between curves; volume (disk/washer & shell methods); average value; work; arc length; surface area.	3 weeks
7. Techniques of Integration	Integration by parts; trigonometric integrals & substitutions; partial fractions; improper integrals; numerical integration.	3–4 weeks
8. Further Applications of Integration	Probability; center of mass; applications as time permits.	1–2 weeks
9. Differential Equations (Intro)	Slope fields; separable equations; exponential growth & decay; logistic model.	2 weeks
10. Infinite Sequences & Series	Convergence tests; power series; Taylor & Maclaurin series; applications.	3–4 weeks
11. Parametric & Polar Curves	Parametric equations; arc length & area; polar coordinates; graphing polar curves.	2–3 weeks
12. Vectors & Geometry of Space (optional)	3-D coordinates; vectors; dot & cross products; lines & planes in space.	2 weeks

Total pacing ≈ 36 weeks. Adjust for AP Calculus AB/BC emphasis and school calendar.



East Rankin Academy

Course Objectives

Prentice Hall Algebra I (ISBN 013052316X)

Algebraic Foundations

Demonstrate understanding of the real number system, including properties, operations, and order of operations. Simplify and evaluate algebraic expressions and apply correct use of variables and exponents.

Linear Equations and Inequalities

Solve one-step, multi-step, and absolute-value equations and inequalities. Represent solutions on number lines and in interval notation. Model and solve real-world problems with linear equations and inequalities.

Functions and Graphs

Understand relations and functions; identify domain and range. Graph linear functions using slope-intercept, point-slope, and standard form. Analyze and interpret slope as rate of change and use transformations to graph functions.

Systems of Equations and Inequalities

Solve systems of linear equations and inequalities by graphing, substitution, and elimination. Interpret the meaning of solutions in real-world contexts.

Polynomials and Factoring

Add, subtract, and multiply polynomials and recognize special products. Factor polynomials completely and solve quadratic equations by factoring.

Quadratic Functions

Graph quadratic functions and identify key features (vertex, axis of symmetry, intercepts). Solve quadratic equations by factoring, completing the square, and using the quadratic formula.

Exponents and Radical Expressions

Apply the laws of exponents and work with scientific notation. Simplify and operate with radical expressions; solve radical equations.

Rational Expressions and Equations

Simplify, multiply, divide, add, and subtract rational expressions. Solve rational equations and interpret their real-world applications.

Data Analysis and Probability

Use statistical measures (mean, median, mode) and interpret various types of graphs. Apply basic probability concepts to simple and compound events.

Mathematical Reasoning and Problem Solving

Develop logical reasoning and communicate mathematical ideas clearly. Apply algebraic techniques to model and solve real-world problems, demonstrating readiness for Geometry and higher mathematics.



East Rankin Academy

Course Objectives
Geometry (ISBN 9780133659481)

Foundations of Geometry

Understand and use the basic structures of geometry including points, lines, planes, segments, and angles. Apply definitions, postulates, and theorems to develop logical reasoning and proof. Use appropriate geometric vocabulary and notation.

Reasoning and Proof

Develop and write formal geometric proofs using deductive reasoning. Apply inductive reasoning to recognize patterns and formulate conjectures.

Parallel and Perpendicular Lines

Prove and apply properties of parallel and perpendicular lines. Use coordinate geometry to analyze slope, distance, and midpoint.

Congruent Triangles

Prove triangles congruent using SSS, SAS, ASA, AAS, and HL criteria. Apply CPCTC and properties of isosceles and equilateral triangles.

Relationships Within Triangles

Identify and use properties of medians, altitudes, perpendicular bisectors, and angle bisectors. Apply triangle inequality theorems and indirect proofs.

Quadrilaterals and Polygons

Classify quadrilaterals and prove their properties. Find angle measures and use coordinate proofs.

Similarity

Use ratios and proportions to establish similarity of figures. Apply properties of similar triangles and polygons in problem solving.

Right Triangles and Trigonometry

Apply the Pythagorean Theorem and its converse. Solve right triangles using special right triangle ratios and basic trigonometric ratios.

Transformations

Perform and analyze transformations including translations, reflections, rotations, and dilations. Identify symmetry and compositions of transformations.

Circles

Apply properties of arcs, chords, tangents, secants, and angles in circles. Use the equation of a circle in coordinate geometry.

Area and Volume

Calculate the area of plane figures and surface area and volume of solids. Apply formulas to solve real-world problems.

Mathematical Reasoning and Applications

Integrate algebra and geometry to model and solve real-world situations. Communicate mathematical reasoning clearly using appropriate vocabulary and notation.



East Rankin Academy

Course Objectives
Prentice Hall Algebra 2 (ISBN 0131339982)

Algebraic Fluency

Simplify and manipulate algebraic expressions—including polynomials, rational expressions, radicals, and complex numbers—using appropriate properties and operations. Solve linear, quadratic, polynomial, rational, radical, exponential, and logarithmic equations and inequalities.

Functions and Graphs

Demonstrate understanding of functions as mathematical relationships, including domain, range, and inverse. Analyze, graph, and transform linear, quadratic, polynomial, radical, rational, exponential, logarithmic, and piecewise-defined functions. Apply function composition and inverse functions to model real-world relationships.

Systems and Matrices

Solve systems of equations and inequalities in two or more variables using graphing, substitution, elimination, and matrix methods. Perform operations on matrices, including finding determinants and inverses, and apply these skills to problem solving.

Trigonometry Foundations

Evaluate and graph trigonometric functions in both degree and radian measure. Apply fundamental trigonometric identities and solve basic trigonometric equations. Use trigonometry in right-triangle and unit-circle contexts and apply the Laws of Sines and Cosines to real-world problems.

Sequences, Series, and Probability

Analyze and represent arithmetic and geometric sequences and series, including use of sigma notation. Apply the Binomial Theorem and basic probability concepts to real-life situations.

Mathematical Reasoning & Problem Solving

Use deductive and inductive reasoning to justify steps in algebraic manipulation and problem solving. Model real-world situations with algebraic equations, functions, and inequalities. Communicate mathematical thinking clearly using appropriate vocabulary and notation.

Preparation for Higher Mathematics

Demonstrate readiness for advanced courses such as Pre-Calculus, College Algebra, or AP Calculus through mastery of key Algebra 2 standards. Integrate technology—graphing calculators or computer software—when appropriate to explore and confirm algebraic concepts.



East Rankin Academy

Course Objectives

Algebra and Trigonometry for College Readiness (ISBN 0131366262)

Algebraic Foundations

Simplify and manipulate expressions involving real numbers, polynomials, rational expressions, and radicals. Solve linear, quadratic, polynomial, rational, radical, exponential, and logarithmic equations and inequalities.

Functions and Graphs

Demonstrate understanding of the concept of a function, including domain, range, and inverse. Graph and analyze linear, quadratic, polynomial, rational, exponential, logarithmic, and piecewise-defined functions. Apply transformations, compositions, and inverses to model real-world relationships.

Trigonometry

Use radian and degree measure, the unit circle, and right triangle relationships. Define, graph, and analyze the six trigonometric functions and their inverses. Verify trigonometric identities and solve trigonometric equations. Apply the Law of Sines and Law of Cosines to solve problems in applied contexts.

Systems and Matrices

Solve systems of linear and nonlinear equations and inequalities using graphing, substitution, elimination, and matrix methods. Perform operations on matrices, find determinants and inverses, and use matrices to solve real-world problems.

Sequences, Series, and Probability

Represent and analyze arithmetic and geometric sequences and series using sigma notation. Apply the Binomial Theorem. Solve basic probability problems involving simple and compound events.

Analytic Geometry

Analyze and graph conic sections including circles, parabolas, ellipses, and hyperbolas. Work with parametric equations and polar coordinates.

Preparation for Higher Mathematics

Develop mathematical reasoning and problem-solving skills needed for Pre-Calculus and college-level mathematics. Communicate mathematical thinking clearly using appropriate vocabulary and notation. Integrate technology such as graphing calculators or computer software when appropriate to explore and confirm concepts.



East Rankin Academy

Course Objectives
Pre-Calculus (ISBN 9780134586588)

Algebraic and Function Foundations

Demonstrate mastery of real and complex numbers, exponents, radicals, and algebraic expressions. Analyze, graph, and transform polynomial, rational, exponential, logarithmic, and piecewise-defined functions. Apply operations such as composition and inversion of functions to model real-world situations.

Trigonometry

Use radian and degree measure and the unit circle to define the six trigonometric functions and their inverses. Graph and analyze trigonometric functions, including amplitude, period, and phase shift. Verify trigonometric identities and solve trigonometric equations. Apply the Law of Sines and Law of Cosines to solve real-world and geometric problems.

Analytic Geometry

Graph and analyze conic sections including circles, parabolas, ellipses, and hyperbolas. Work with parametric equations and polar coordinates.

Systems and Matrices

Solve systems of linear and nonlinear equations using graphing, substitution, elimination, and matrix methods. Perform matrix operations; compute determinants and inverses; apply these techniques to solve real-world problems.

Sequences, Series, and Probability

Represent and analyze arithmetic and geometric sequences and series using sigma notation. Apply the Binomial Theorem and basic probability concepts.

Introduction to Calculus

Explore the concept of limits and continuity. Investigate the derivative as an instantaneous rate of change and basic applications.

Mathematical Reasoning and Problem Solving

Use deductive and inductive reasoning to justify steps in problem solving. Communicate mathematical thinking clearly using appropriate notation and vocabulary. Integrate technology such as graphing calculators or computer software when appropriate to explore and confirm concepts.



East Rankin Academy

Course Objectives

Senior Algebra – College Algebra (ISBN 0495558885)

Algebraic Foundations

Demonstrate understanding of real numbers, exponents, radicals, and algebraic expressions. Solve linear, quadratic, polynomial, rational, radical, exponential, and logarithmic equations and inequalities. Apply correct order of operations and properties of real numbers.

Functions and Graphs

Define and evaluate functions; determine domain and range. Graph and analyze linear, quadratic, polynomial, rational, exponential, and logarithmic functions. Perform transformations, compositions, and inverses of functions to model real-world situations.

Systems and Matrices

Solve systems of linear equations and inequalities using graphing, substitution, elimination, and matrix methods. Perform matrix operations; find determinants and inverses; apply matrices to solve real-world problems.

Polynomial and Rational Functions

Use polynomial division and theorems of zeros. Determine end behavior and graph polynomial functions. Simplify and solve rational expressions and equations; analyze asymptotic behavior.

Exponential and Logarithmic Functions

Explore exponential growth and decay models. Apply laws of logarithms to solve exponential and logarithmic equations.

Sequences, Series, and Probability

Represent and analyze arithmetic and geometric sequences and series using sigma notation. Apply the Binomial Theorem. Solve basic probability problems for simple and compound events.

Conic Sections and Analytic Geometry

Graph and analyze circles, parabolas, ellipses, and hyperbolas. Work with parametric equations when appropriate.

Mathematical Reasoning and Problem Solving

Use logical reasoning and appropriate notation to communicate solutions. Model real-world problems using algebraic techniques and verify solutions with technology when appropriate.



East Rankin Academy

Course Objectives
Calculus (ISBN 9781337613927)

Limits and Continuity

Evaluate limits graphically, numerically, and analytically. Apply limit laws to determine the behavior of functions. Determine continuity and identify and classify discontinuities.

Derivatives

Define the derivative as a limit and interpret it as an instantaneous rate of change or slope of a tangent line. Differentiate polynomial, rational, trigonometric, exponential, and logarithmic functions using standard rules. Apply implicit differentiation and related rates. Use derivatives to solve problems in motion, optimization, and curve analysis.

Applications of Derivatives

Find extrema and analyze functions using the Mean Value Theorem. Use derivatives for curve sketching and to determine intervals of increase, decrease, and concavity. Apply L'Hospital's Rule for indeterminate forms.

Integrals

Evaluate definite and indefinite integrals using antiderivatives, the Fundamental Theorem of Calculus, and substitution. Approximate integrals with Riemann sums and numerical methods.

Applications of Integration

Calculate areas between curves, volumes of solids of revolution, and other geometric quantities. Determine arc length, surface area, and average value of a function. Solve problems involving work and center of mass.

Techniques of Integration

Apply integration by parts, trigonometric substitutions, partial fractions, and other methods to evaluate integrals. Handle improper integrals and understand convergence.

Differential Equations

Solve basic first-order differential equations including separable and exponential growth/decay models. Interpret slope fields and logistic models.

Infinite Sequences and Series

Test infinite series for convergence or divergence. Represent functions with power series and find Taylor and Maclaurin series.

Parametric and Polar Curves

Work with parametric equations and polar coordinates. Find derivatives, areas, and arc lengths in these coordinate systems.

Vectors and Geometry of Space

Understand three-dimensional coordinate systems and vector operations. Use dot and cross products to solve geometric problems. Represent lines and planes in space.