

Algebra II

SCOPE + SEQUENCE

CONTENT OFFERED IN CARNEGIE LEARNING™ MATH SOLUTIONS

Textbook	Cognitive Tutor® Software	Skills Covered
Print Chapter	Software Unit	The student will:
1. Linear Functions, Equations and Functions	<ol style="list-style-type: none"> Linear Models and Four Quadrant Graphs Linear Models in General Form Graphs of Linear Equations in Two Variables Absolute Value Equation and Inequalities Relations and Functions Linear Function Operations and Composition Graphs of Functions Inverses of Functions 	<ul style="list-style-type: none"> Solve linear equations in one variable. Solve linear inequalities in one variable and graph the solution on a number line. Represent linear functions using equations, tables, and graphs. Write an equation of a line in slope-intercept form, general form and point-slope form. Transform a linear function. Solve absolute value equations and inequalities in one variable. Graph absolute value functions in two variables. Use function notation. Find the inverse of a linear function. Represent a piecewise function using equations, tables and graphs.
2. Systems of Linear Equations and Inequalities	<ol style="list-style-type: none"> Systems of Linear Equations Modeling B Systems of Linear Equations Graphs of Linear Inequalities in Two Variables Systems of Linear Inequalities 	<ul style="list-style-type: none"> Determine the number of solutions of a linear system. Solve linear systems graphically, using the substitution method, using the elimination method and using Cramer's Rule. Determine consistency and dependence of linear systems. Write and graph an inequality in two variables. Write and graph a system of linear inequalities. Solve a system of three linear equations in three unknowns.
3. Quadratic Functions	<ol style="list-style-type: none"> Quadratic Models in Factored Form Linear and Quadratic Transformations Quadratic Expression Factoring Quadratic Equation Solving using Factoring Forms of Quadratics Graphs and Equations of Quadratic Functions Quadratic Equation Solving Quadratic Models in General Form 	<ul style="list-style-type: none"> Represent quadratic functions using equations, tables and graphs. Determine the key characteristics of the graph of a quadratic function including: domain, range, intercepts, vertex, line of symmetry, maximum or minimum and concavity. Solve quadratic equations using factoring method and the Quadratic Formula. Transform a quadratic function. Write an equation of a quadratic function in general form, vertex form and factored form. Multiply and factor polynomials. Complete the square. Use the discriminant to determine the number and type of roots.
4. The Real Number System	<ol style="list-style-type: none"> Rational and Irrational Numbers Simplification and Operations with Radicals Operations with Complex Numbers 	<ul style="list-style-type: none"> Classify numbers as counting numbers, whole numbers, integers, rational numbers and irrational numbers. Convert a repeating decimal to a fraction. Identify and use properties of real numbers. Convert between radical form and exponential form. Simplify radicals using imaginary numbers. Solve quadratic equations with complex solutions. Add, subtract, multiply and divide complex numbers.
5. Polynomial Functions	<ol style="list-style-type: none"> Graphs of Polynomial Functions Polynomial Operations Cubic Models Quadratic Equation Solving with Complex Roots 	<ul style="list-style-type: none"> Represent polynomial functions using equations, tables and graphs. Determine the key characteristics of the graph of a polynomial function including: domain, range, intercepts, extrema, intervals of increase and decrease and end behavior. Solve polynomial equations and inequalities graphically and by factoring. Use the Fundamental Theorem of Algebra. Add, subtract and multiply polynomials. Divide polynomials using long division and synthetic division. Use the Remainder and Factor Theorems.
6. Exponential and Logarithmic Functions	<ol style="list-style-type: none"> Properties of Exponents Exponential Modeling Linear and Exponential Transformations Logarithmic and Exponential Equations 	<ul style="list-style-type: none"> Represent exponential functions using equations, tables and graphs. Determine the key characteristics of the graph of an exponential or logarithmic function including: domain, range, intercepts, asymptotes and end behavior. Use the properties of exponents. Find the inverse of an exponential function. Use the properties of logarithms. Represent logarithmic functions using equations, tables and graphs. Solve exponential and logarithmic equations.

CONTENT OFFERED IN CARNEGIE LEARNING™ MATH SOLUTIONS

Textbook	Cognitive Tutor® Software	Skills Covered
Print Chapter	Software Unit	The student will:
7. Rational Equations and Functions	32. Rational Models as Ratios 33. Rational Expressions 34. Rational Equations 35. Rational Models and Independent Variables 36. Work, Mixture, and Distance Problems	<ul style="list-style-type: none"> • Represent rational functions using equations, tables and graphs. • Determine the key characteristics of the graph of a rational function including: domain, range, intercepts, extrema, intervals of increase and decrease, asymptotes, discontinuities and end behavior. • Simplify rational expressions. • Add, subtract, multiply and divide rational expressions. • Solve rational equations and inequalities.
8. Radical Equations and Functions	48. Linear, Quadratic, Exponential, Cubic, & Square Root Transformations 49. Function Transformations	<ul style="list-style-type: none"> • Represent radical functions using equations, tables and graphs. • Determine the key characteristics of the graph of a rational function including: domain, range, intercepts and end behavior. • Transform a radical function. • Simplify radical expressions involving variables. • Add, subtract, multiply and divide radical expressions involving variables. • Solve radical equations.
9. Conic Sections		<ul style="list-style-type: none"> • Represent conics using equations, tables and graphs. • Determine the key characteristics of the graph of a conic. • Solve application problems using conics.
10. Trigonometric Ratios and Functions	37. One-Step Trigonometric Equations 38. Right Triangles and Trigonometric Functions 39. Trigonometric Models	<ul style="list-style-type: none"> • Use the Unit Circle. • Write ratios representing the sine, cosine and tangent of angles. • Find and use the sine, cosine and tangent of angles. • Find the inverse of sine, cosine and tangent functions.
11. Trigonometric Graphs, Identities and Equations	40. Trigonometric Transformations 41. Multiple-Step Trigonometric Equations 42. Trigonometric Equations and Identities	<ul style="list-style-type: none"> • Represent trigonometric functions using equations, tables and graphs. • Determine the key characteristics of the graph of a trigonometric function including: domain, range, intercepts, amplitude, period and phase shift. • Use trigonometric identities. • Solve trigonometric equations.
12. Sequences and Series		<ul style="list-style-type: none"> • Define an arithmetic sequence explicitly and recursively. • Define a geometric sequence explicitly and recursively. • Find arithmetic and geometric series. • Find sums for infinite series.
13. Counting Methods and Probability	43. Single Event Probability 44. Independent and Dependent Probabilities	<ul style="list-style-type: none"> • Find simple and compound probabilities. • Find permutations and combinations. • Use Pascal's Triangle and the Binomial Theorem. • Use experimental probabilities to make predictions.
14. Statistics	45. Measures of Central Tendency 46. Box and Whisker Plots 47. Variance and Standard Deviation	<ul style="list-style-type: none"> • Find the mean, median, mode and range of a data set. • Find the standard deviation of a data set. • Find quartiles, percentiles and standard distribution for a data set. • Find the equation of a line of best fit. • Use a line of best fit to make predictions. • Find the equation of a curve of best fit. • Use a curve of best fit to make predictions.
15. Matrices		<ul style="list-style-type: none"> • Add and subtract matrices. • Multiply a matrix by a scalar. • Multiply two matrices. • Solve matrix equations. • Use matrices to solve systems of linear equations.