

Algebra 2

Chapter 1 Tools of Algebra

1.1 Real numbers and number operations

<http://learnzillion.com/lessons?utf8=%E2%9C%93&filters%5Bsubject%5D=math&query=real+numbers+>

<http://www.khanacademy.org/math/arithmetric/absolute-value/add-sub-negatives/v/number-line-3-exercise-example>

http://www.khanacademy.org/math/arithmetric/order-of-operations/arithmetric_properties/v/commutative-law-of-addition

1.2 Algebraic expressions

<http://learnzillion.com/lessons/1577-solve-multistep-problems-with-positive-and-negative-decimals-using-order-of-operations>

http://www.khanacademy.org/math/arithmetric/order-of-operations/order_of_operations/v/introduction-to-order-of-operations

1.3 simplifying Algebraic Expressions

<http://learnzillion.com/lessons/3411-simplify-algebraic-expressions-by-combining-like-terms-and-applying-the-distributive-property>

<http://www.khanacademy.org/math/algebra/introduction-to-algebra/manipulating-expressions/v/combining-like-terms>

1.4 Solving Linear equations - 1 and 2 step equations

http://www.khanacademy.org/math/algebra/solving-linear-equations-and-inequalities/equations_beginner/v/simple-equations

<http://www.khanacademy.org/math/algebra/solving-linear-equations-and-inequalities/basic-equation-practice/v/equations-3>

1.5 rewriting equations and Formulas- literal equations, isolate variable

http://www.khanacademy.org/math/algebra/solving-linear-equations-and-inequalities/equations_beginner/v/simple-equations

http://www.khanacademy.org/math/algebra/solving-linear-equations-and-inequalities/solving_for_variable/v/solving-for-a-variable-2

1.6 problem solving using algebraic models- word problems :age ,geometry, general

<http://learnzillion.com/lessons?utf8=%E2%9C%93&filters%5Bsubject%5D=math&query=linear+word+problems>

http://www.khanacademy.org/math/algebra/solving-linear-equations-and-inequalities/equations_beginner/v/application-problems-with-equation-in-one-variable

http://www.khanacademy.org/math/algebra/solving-linear-equations-and-inequalities/age_word_problems_tut/v/ex-1-age-word-problem

Chapter 2 Linear Equations and Functions

2.1 Functions and their graphs; domain, range, vertical line test

<http://www.khanacademy.org/math/algebra/linear-equations-and-inequalitie/coordinate-plane/v/descartes-and-cartesian-coordinates>

<http://learnzillion.com/lessons?utf8=%E2%9C%93&filters%5Bsubject%5D=math&query=vertical+line+test>

<http://learnzillion.com/lessons/2813-understand-functions-in-terms-of-inputs-and-outputs>

http://www.khanacademy.org/math/algebra/algebra-functions/domain_and_range/v/relations-and-functions

2.2 Linear Functions and Function Notation

<http://learnzillion.com/lessons/1316-recognize-the-characteristics-of-a-linear-function>

http://www.khanacademy.org/math/algebra/linear-equations-and-inequality/graphing_solutions2/v/recognizing-linear-functions

2.3 Slope and Rate of Change

<http://learnzillion.com/lessons/3462-find-the-slope-of-a-linear-function-using-two-points>

<http://www.khanacademy.org/math/algebra/linear-equations-and-inequality/slope-and-intercepts/v/slope-of-a-line>

2.4 Quick graphs of Linear Equations: graph lines in slope intercept form and using intercepts. Identify parallel and perpendicular lines.

<http://learnzillion.com/lessons/251-write-the-equations-of-parallel-lines>

<http://learnzillion.com/lessons/252-write-the-equations-of-perpendicular-lines>

http://www.khanacademy.org/math/algebra/linear-equations-and-inequality/graphing_with_intercepts/v/graphing-using-x-and-y-intercepts

<http://www.khanacademy.org/math/algebra/linear-equations-and-inequality/graphing-slope-intercept/v/graphing-a-line-in-slope-intercept-form>

2.5 Writing Equations of Lines

<http://www.khanacademy.org/math/algebra/linear-equations-and-inequality/equation-of-a-line/v/linear-equations-in-slope-intercept-form>

2.6 Direct Variation

<http://learnzillion.com/lessons/2481-identify-direct-and-inverse-variation-by-looking-at-the-shape-of-graphs>

http://www.khanacademy.org/math/algebra/algebra-functions/direct_inverse_variation/v/direct-and-inverse-variation

Chapter 3 Systems of Linear Equations

3.1 solving linear systems by graphing

<http://learnzillion.com/lessons/1363-solve-a-system-of-a-quadratic-and-linear-equation-by-graphing-no-real-solutions>

<http://www.khanacademy.org/math/algebra/systems-of-eq-and-ineq/systems-through-examples/v/solving-linear-systems-by-graphing>

3.2 solving linear systems by substitution

<http://learnzillion.com/lessons/2444-solve-a-system-of-linear-equations-using-substitution>

<http://www.khanacademy.org/math/algebra/systems-of-eq-and-ineq/systems-with-substitution/v/solving-systems-by-substitution-1>

3.3 solving linear systems by linear combinations

<http://learnzillion.com/lessons/732-solve-simple-systems-of-equations-by-linear-combination-elimination>

<http://www.khanacademy.org/math/algebra/systems-of-eq-and-ineq/solving-systems-addition-elimination/v/solving-systems-by-elimination>

Chapter 4

4.1 solving linear inequalities

http://www.khanacademy.org/math/algebra/linear_inequalities/inequalities/v/inequalities-using-multiplication-and-division

http://www.khanacademy.org/math/algebra/linear_inequalities/compound_absolute_value_in_equality/v/compound-inequalities

http://www.khanacademy.org/math/algebra/linear_inequalities/compound_absolute_value_inequalities/v/compound-inequalities

4.2 linear inequalities in two variables

<http://learnzillion.com/lessons/2968-graphing-linear-inequalities-with-a-or-symbol>

4.3 System of linear inequalities

<http://learnzillion.com/lessons/3078-graph-systems-of-inequalities-by-shading-their-intersection>

<http://www.khanacademy.org/math/algebra/systems-of-equations-and-inequalities/system-of-inequalities/v/testing-solutions-for-a-system-of-inequalities>

4.4 solving absolute value equations

<http://learnzillion.com/lessons/243-solve-absolute-value-equations>

<http://www.khanacademy.org/math/algebra/solving-linear-equations-and-inequalities/absolute-value-equations/v/absolute-value-equations>

4.5 solving absolute value inequalities

<http://learnzillion.com/lessons/244-solve-absolute-value-conjunction-inequalities>

<http://learnzillion.com/lessons/245-solve-absolute-value-disjunction-inequalities>

4.6 absolute value functions

<http://learnzillion.com/lessons/2897-graph-absolute-value-functions>

Chapter 5

5.1 Graphing quadratic functions

<http://www.khanacademy.org/math/algebra/multiplying-factoring-expression/multiplying-binomials/v/multiplying-binomials>

http://www.khanacademy.org/math/algebra/quadratics/solving_graphing_quadratics/v/graphing-a-quadratic-function

http://www.khanacademy.org/math/algebra/quadratics/solving_graphing_quadratics/e/graphing_parc_bolas_0.5

5.2 Graphing quadratic functions in vertex form

http://www.khanacademy.org/math/algebra/quadratics/solving_graphing_quadratics/v/graphing-a-parabola-in-vertex-form

5.3 Factoring $x^2 + bx + c$

<http://www.khanacademy.org/math/algebra/multiplying-factoring-expression/factoring-quadratic-expressions/v/factoring-polynomials-1>

http://www.khanacademy.org/math/algebra/quadratics/factoring_quadratics/v/Example%201:%20Solving%20a%20quadratic%20equation%20by%20factoring

5.4 Factoring $ax^2 + bx + c$

<http://www.khanacademy.org/math/algebra/multiplying-factoring-expression/factoring-by-grouping/v/factor-by-grouping-and-factoring-completely>

<http://www.khanacademy.org/math/algebra/multiplying-factoring-expression/factoring-by-grouping/v/factoring-trinomials-with-a-non-1-leading-coefficient-by-grouping>

http://www.khanacademy.org/math/algebra/quadratics/factoring_quadratics/v/Example%201:%20Solving%20a%20quadratic%20equation%20by%20factoring

5.5 Factoring using special patterns

<http://www.khanacademy.org/math/algebra/multiplying-factoring-expression/factoring-special-products/v/factoring-special-products>

<http://www.khanacademy.org/math/algebra/multiplying-factoring-expression/factoring-special-products/v/factoring-difference-of-squares>

<http://www.khanacademy.org/math/algebra/multiplying-factoring-expression/factoring-special-products/v/factoring-perfect-square-trinomials>

5.6 Solving Quadratic Equations by Finding Square Roots

<http://www.khanacademy.org/math/arithmetical-exponents-radicals/radical-radicals/v/simplifying-square-roots-1>

5.7 Complex Numbers

http://www.khanacademy.org/math/algebra/complex-numbers/imaginary_unit_i/v/introduction-to-i-and-imaginary-numbers

http://www.khanacademy.org/math/algebra/complex-numbers/imaginary_unit_i/v/imaginary-roots-of-negative-numbers

http://www.khanacademy.org/math/algebra/complex-numbers/complex_numbers/v/adding-complex-numbers

http://www.khanacademy.org/math/algebra/complex-numbers/complex_numbers/v/multiplying-complex-numbers

http://www.khanacademy.org/math/algebra/complex-numbers/complex_numbers/v/dividing-complex-numbers

5.8 Completing the Square

http://www.khanacademy.org/math/algebra/quadratics/completing_the_square/v/solving-quadratic-equations-by-completing-the-square

5.9 Quadratic Formula and the Discriminant

http://www.khanacademy.org/math/algebra/quadratics/quadratic_formula/v/using-the-quadratic-formula

http://www.khanacademy.org/math/algebra/quadratics/quadratic_formula/v/discriminant-of-quadratic-equations

Chapter 6

6.1 Properties of Exponents

<http://www.khanacademy.org/math/algebra/exponent-equations/exponent-properties-algebra/v/exponent-properties-1>

<http://www.khanacademy.org/math/algebra/exponent-equations/exponent-properties-algebra/v/exponent-properties-2>

<http://www.khanacademy.org/math/algebra/exponent-equations/exponent-properties-algebra/v/exponent-properties-3>

<http://www.khanacademy.org/math/algebra/exponent-equations/exponent-properties-algebra/v/negative-and-positive-exponents>

6.2 Polynomial Functions and Their Graphs

http://www.khanacademy.org/math/trigonometry/polynomial_and_rational/polynomial-end-behavior/v/polynomial-end-behavior

http://www.khanacademy.org/math/trigonometry/polynomial_and_rational/polynomial-end-behavior/v/polynomial-end-behavior-exercise-example

6.3 Adding and Subtracting Polynomials

http://www.khanacademy.org/math/trigonometry/polynomial_and_rational/polynomial_tutorial/v/addition-and-subtraction-of-polynomials

6.4 Multiplying and Dividing Polynomials

<http://www.khanacademy.org/math/algebra/multiplying-factoring-expression/multiplying-binomials/v/multiplying-binomials>

http://www.khanacademy.org/math/trigonometry/polynomial_and_rational/polynomial_tutorial/v/multiplying-polynomials

http://www.khanacademy.org/math/trigonometry/polynomial_and_rational/dividing_polynomials/v/dividing-polynomials-1

http://www.khanacademy.org/math/trigonometry/polynomial_and_rational/synthetic-division/v/synthetic-division

6.5 Factoring Cubic Polynomials

http://www.khanacademy.org/math/trigonometry/polynomial_and_rational/factoring-higher-degree-polynomials/v/factoring-sum-of-cubes

http://www.khanacademy.org/math/trigonometry/polynomial_and_rational/factoring-higher-degree-polynomials/v/factoring-5th-degree-polynomial-to-find-real-zeros

<http://www.khanacademy.org/math/algebra/multiplying-factoring-expression/factoring-by-grouping/v/factoring-trinomials-by-grouping-1>

6.6 Polynomials of Greater Degree

<http://www.khanacademy.org/math/algebra/multiplying-factoring-expression/factoring-special-products/v/factoring-to-produce-difference-of-squares>

Chapter 7

7.1 nth Roots and Rational Exponents

<http://www.khanacademy.org/math/algebra/exponent-equations/simplifying-radical-expressions/v/radical-equivalent-to-rational-exponents-2>

<http://www.khanacademy.org/math/algebra/exponent-equations/simplifying-radical-expressions/v/radical-expressions-with-higher-roots>

7.2 Properties of Rational Exponents

<http://www.khanacademy.org/math/algebra/exponent-equations/simplifying-radical-expressions/v/how-to-rationalize-a-denominator>

<http://www.khanacademy.org/math/algebra/exponent-equations/simplifying-radical-expressions/v/simplifying-cube-roots>

7.3 Solving Radical Equations

<http://www.khanacademy.org/math/algebra/exponent-equations/radical-equations/v/solving-radical-equations>

<http://www.khanacademy.org/math/algebra/exponent-equations/radical-equations/v/solving-radical-equations-3>

7.4 Function Operations and Composition of functions

<http://www.khanacademy.org/math/algebra/algebra-functions/eval-function-expressions/v/evaluating-composite-functions-example-1>

<http://www.khanacademy.org/math/algebra/algebra-functions/eval-function-expressions/v/sum-of-functions>

<http://www.khanacademy.org/math/algebra/algebra-functions/eval-function-expressions/v/difference-of-functions>

7.5 Inverse functions

<http://www.khanacademy.org/math/algebra/algebra-functions/function-inverses/v/introduction-to-function-inverses>

<http://www.khanacademy.org/math/algebra/algebra-functions/function-inverses/v/function-inverse-example-1>

<http://www.khanacademy.org/math/algebra/algebra-functions/function-inverses/v/function-inverses-example-2>

Chapter 8 Exponential and Logarithmic Functions

8.1 Exponential Growth

<http://www.khanacademy.org/private/college-math-algebra2-trig/equations-inequal-accuplacer/v/exponential-growth-functions>

8.2 Exponential Decay

<http://www.khanacademy.org/science/chemistry/radioactive-decay/v/types-of-decay>

<http://www.khanacademy.org/science/chemistry/radioactive-decay/v/introduction-to-exponential-decay>

8.4 Logarithms and Logarithmic Functions

http://www.khanacademy.org/math/algebra/logarithms-tutorial/logarithm_basics/v/logarithms

http://www.khanacademy.org/math/algebra/logarithms-tutorial/logarithm_basics/v/logarithmic-equations-2

8.5 Properties of Logarithms

http://www.khanacademy.org/math/algebra/logarithms-tutorial/logarithm_properties/v/introduction-to-logarithm-properties

http://www.khanacademy.org/math/algebra/logarithms-tutorial/logarithm_properties/v/sum-of-logarithms-with-same-base

http://www.khanacademy.org/math/algebra/logarithms-tutorial/logarithm_properties/v/logarithm-of-a-power

http://www.khanacademy.org/math/algebra/logarithms-tutorial/logarithm_properties/v/introduction-to-logarithm-properties--part-2

8.6 Solving Exponential and Logarithmic Functions

http://www.khanacademy.org/math/algebra/logarithms-tutorial/logarithm_properties/v/solving-logarithmic-equations_DUP_1

http://www.khanacademy.org/math/algebra/logarithms-tutorial/logarithm_properties/v/solving-logarithmic-equations

http://www.khanacademy.org/math/trigonometry/exponential_and_logarithmic_func/log_functions/v/comparing-exponential-logarithmic-functions

Chapter 9: Rational Equations and Functions

9.1 Inverse and Joint Variations

http://www.khanacademy.org/math/algebra/algebra-functions/direct_inverse_variation/v/direct-and-inverse-variation

http://www.khanacademy.org/math/algebra/algebra-functions/direct_inverse_variation/v/direct-inverse-and-joint-variation

9.3 Simplifying and Multiplying Rational Expressions

<http://www.khanacademy.org/math/algebra-a2/rational-expressions/simplifying-rational-alg/v/simplifying-rational-expressions-introduction>

<http://www.khanacademy.org/math/algebra-a2/rational-expressions/simplifying-rational-alg/v/simplifying-rational-expressions-3>

<http://www.khanacademy.org/math/algebra-a2/rational-expressions/multi-div-rational-exp/v/multiplying-and-simplifying-rational-expressions>

<http://www.khanacademy.org/math/algebra-a2/rational-expressions/multi-div-rational-exp/v/multiplying-and-dividing-rational-expressions-2>

9.4 Dividing Rational Expressions

<http://www.khanacademy.org/math/algebra-a2/rational-expressions/multi-div-rational-exp/v/multiplying-and-dividing-rational-expressions-3>

9.5 Adding and Subtracting Rational Expressions

http://www.khanacademy.org/math/algebra-a2/rational-expressions/rational_expressions/v/adding-and-subtracting-rational-expressions-2

http://www.khanacademy.org/math/algebra-a2/rational-expressions/rational_expressions/v/adding-and-subtracting-rational-expressions-2

9.6 Solving Rational Expressions

<http://www.khanacademy.org/math/algebra-a2/rational-expressions/solving-rational-equations/v/rational-equations>

<http://www.khanacademy.org/math/algebra-a2/rational-expressions/solving-rational-equations/v/solving-rational-equations-2>

<http://www.khanacademy.org/math/algebra-a2/rational-expressions/solving-rational-equations/v/solving-rational-equations-3>

Chapter 10: Statistics and Probability

1.7/1.8 Analyzing Data/Frequency Distributions/Histograms/Box and Whisker

<http://www.khanacademy.org/test-prep/college-arithmetic/stat-brushups/v/statistics-intro--mean--median-and-mode>

<http://www.khanacademy.org/math/probability/descriptive-statistics/Box-and-whisker%20plots/v/box-and-whisker-plots>

<http://www.khanacademy.org/test-prep/college-arithmetic/interpret-data-brushups/v/histograms>

2.7 Scatter Plots

<http://www.khanacademy.org/math/cc-eighth-grade-math/cc-8th-data/cc-8th-scatter-plots/v/constructing-scatter-plot-exercise-example>

<http://www.khanacademy.org/math/cc-eighth-grade-math/cc-8th-data/cc-8th-scatter-plots/v/constructing-scatter-plot>

10.3 Transformations of Data

http://www.khanacademy.org/math/probability/descriptive-statistics/central_tendency/e/interpreting-and-comparing-data-distributions

10.4 Fundamental Counting Principle and Permutations

http://www.khanacademy.org/math/probability/probability-and-combinatorics-topic/permutations_and_combinations/v/permutations

http://www.khanacademy.org/math/probability/probability-and-combinatorics-topic/permutations_and_combinations/v/permutations-and-combinations-2

10.5 Combinations

http://www.khanacademy.org/math/probability/probability-and-combinatorics-topic/permutations_and_combinations/v/combinations

10.6 Introduction to Probability

http://www.khanacademy.org/math/probability/probability-and-combinatorics-topic/probability_combinatorics/v/events-and-outcomes-3

http://www.khanacademy.org/math/probability/independent-dependent-probability/basic_probability/v/probability-space-exercise-example

10.7 Probability of Compound Events

http://www.khanacademy.org/math/probability/independent-dependent-probability/addition_rule_probability/v/probability-with-playing-cards-and-venn-diagrams

http://www.khanacademy.org/math/probability/independent-dependent-probability/independent_events/v/events-and-outcomes-2

10.8 Probability of Dependent and Independent Events

http://www.khanacademy.org/math/probability/independent-dependent-probability/dependent_probability/v/introduction-to-dependent-probability

http://www.khanacademy.org/math/probability/independent-dependent-probability/dependent_probability/v/independent-events-1

http://www.khanacademy.org/math/probability/independent-dependent-probability/dependent_probability/v/dependent-probability-example-1

Chapter 11: Discrete Mathematics

11.1 Matrix Operations

http://www.khanacademy.org/math/algebra2/algebra-matrices/Basic_matrix_operations/v/introduction-to-the-matrix

http://www.khanacademy.org/math/algebra2/algebra-matrices/Basic_matrix_operations/v/scalar-multiplication

http://www.khanacademy.org/math/algebra2/algebra-matrices/Basic_matrix_operations/v/matrix-addition-and-subtraction-1

11.2 Multiplying Matrices

http://www.khanacademy.org/math/algebra2/algebra-matrices/matrix_multiplication/v/matrix-multiplication-intro

http://www.khanacademy.org/math/algebra2/algebra-matrices/matrix_multiplication/v/multiplying-a-matrix-by-a-matrix

11 Extension: Determinants and Cramer's Rule

http://www.khanacademy.org/math/algebra2/algebra-matrices/inverting_matrices/v/finding-the-determinant-of-a-2x2-matrix

11.4 An Introduction to Sequences and Series

http://www.khanacademy.org/math/precalculus/seq_induction/seq_and_series/v/explicit-and-recursive-definitions-of-sequences

11.5 Arithmetic Sequences and Series

http://www.khanacademy.org/math/precalculus/seq_induction/seq_and_series/v/arithmic-sequences

http://www.khanacademy.org/math/precalculus/seq_induction/seq_and_series/v/series-as-sum-of-sequence

11.6 Geometric Sequence and Series

http://www.khanacademy.org/math/precalculus/seq_induction/precalc-geometric-sequences/v/geometric-sequences--introduction

http://www.khanacademy.org/math/precalculus/seq_induction/precalc-geometric-sequences/v/geometric-sequences

11.7 Infinite Geometric Series

http://www.khanacademy.org/math/precalculus/seq_induction/infinite-geometric-series/v/infinite-geometric-series

Chapter 13 Conic Sections

Introduction to Conic Sections

http://www.khanacademy.org/math/algebra2/conics_precalc/conic_section_intro/v/introduction-to-conic-sections

13.1 Distance and midpoint formulas

<http://www.khanacademy.org/math/algebra/linear-equations-and-inequalitie/more-analytic-geometry/v/distance-formula>

<http://www.khanacademy.org/math/algebra/linear-equations-and-inequalitie/more-analytic-geometry/v/midpoint-formula>

13.2 Parabolas

http://www.khanacademy.org/math/algebra2/conics_precalc/parabolas_precalc/v/parabola-intuition-example-1

http://www.khanacademy.org/math/algebra2/conics_precalc/parabolas_precalc/v/parabola-focus-and-directrix-1

13.3 Circles

http://www.khanacademy.org/math/algebra2/conics_precalc/circles-tutorial-precac/v/radius-and-center-for-a-circle-equation-in-standard-form

13.4 Ellipses

http://www.khanacademy.org/math/algebra2/conics_precalc/ellipses-precac/v/conic-sections--intro-to-ellipses

http://www.khanacademy.org/math/algebra2/conics_precalc/ellipses-precac/v/foci-of-an-ellipse

13.5 Hyperbolas

http://www.khanacademy.org/math/algebra2/conics_precalc/hyperbolas-precac/v/conic-sections--intro-to-hyperbolas

http://www.khanacademy.org/math/algebra2/conics_precalc/hyperbolas-precac/v/conic-sections--hyperbolas-2

http://www.khanacademy.org/math/algebra2/conics_precalc/hyperbolas-precac/v/foci-of-a-hyperbola