**Algebra 2**

**Khan Academy Video Correlations  
By SpringBoard Activity**

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| **SB Activity** | **Video(s)** |
| **Unit 1: Equations, Inequalities, Functions** | |
| **Activity 1**  *Creating Equations*  1-1 Learning Targets:   * Create an equation in one variable from a real-world context. * Solve an equation in one variable.   1-2 Learning Targets:   * Create equations in two variables to represent relationships between quantities. * Graph two-variable equations   1-3 Learning Targets:   * Write, solve, and graph absolute value equations. * Solve and graph absolute value inequalities. | ***One-Variable Equations*** |
| [**Representing a relationship with a simple equation**](http://www.khanacademy.org/math/algebra/solving-linear-equations-and-inequalities/why-of-algebra/v/representing-a-relationship-with-a-simple-equation)  [**Linear equation word problem**](http://www.khanacademy.org/math/algebra/solving-linear-equations-and-inequalities/linear-equation-word-problems-tu/v/linear-equation-word-problem-example)  [**Word problem: solving equations**](http://www.khanacademy.org/math/algebra/solving-linear-equations-and-inequalities/linear-equation-word-problems-tu/v/application-problems-with-equation-in-one-variable)  [**Solving equations with the distributive property**](http://www.khanacademy.org/math/algebra/solving-linear-equations-and-inequalities/complicated_equations/v/solving-equations-with-the-distributive-property)  [**Ex 2: Multi-step equation**](http://www.khanacademy.org/math/algebra/solving-linear-equations-and-inequalities/complicated_equations/v/ex-2-multi-step-equation)  [**Variables on both sides**](http://www.khanacademy.org/math/algebra/solving-linear-equations-and-inequalities/basic-equation-practice/v/equations-3) |
| ***Two-Variable Equations*** |
| [**Constructing linear equations to solve word problems**](http://www.khanacademy.org/math/algebra/linear-equations-and-inequalitie/equation-of-a-line/v/word-problem-solving-4)  [**Exploring linear relationships**](http://www.khanacademy.org/math/algebra/linear-equations-and-inequalitie/graphing_solutions2/v/exploring-linear-relationships)  [**Graphs of linear equations**](http://www.khanacademy.org/math/algebra/linear-equations-and-inequalitie/graphing_solutions2/v/graphs-of-linear-equations)  [**Application problem with graph**](http://www.khanacademy.org/math/algebra/linear-equations-and-inequalitie/graphing_solutions2/v/application-problem-with-graph) |
| ***Absolute Value Equations and Inequalities*** |
| [**Absolute value equations**](http://www.khanacademy.org/math/algebra/solving-linear-equations-and-inequalities/absolute-value-equations/v/absolute-value-equations)  [**Absolute value equations**](http://www.khanacademy.org/math/algebra/solving-linear-equations-and-inequalities/absolute-value-equations/v/u02-l2-t2-we1-absolute-value-equations-avi)  [**Absolute value equations 1**](http://www.khanacademy.org/math/algebra/solving-linear-equations-and-inequalities/absolute-value-equations/v/absolute-value-equations-1)  [**Absolute value equation example**](http://www.khanacademy.org/math/algebra/solving-linear-equations-and-inequalities/absolute-value-equations/v/absolute-value-equation-example)  [**Absolute value equations example 1**](http://www.khanacademy.org/math/algebra/solving-linear-equations-and-inequalities/absolute-value-equations/v/absolute-value-equations-example-1)  [**Absolute value equation example 2**](http://www.khanacademy.org/math/algebra/solving-linear-equations-and-inequalities/absolute-value-equations/v/absolute-value-equation-example-2)  [**Absolute value equation with no solution**](http://www.khanacademy.org/math/algebra/solving-linear-equations-and-inequalities/absolute-value-equations/v/absolute-value-equation-with-no-solution) |
| ***Absolute Value Inequalities*** |
| [**Absolute value inequalities**](http://www.khanacademy.org/math/algebra/solving-linear-equations-and-inequalities/absolute-value-equations/v/absolute-value-inequalities)  [**Absolute value inequalities example 1**](http://www.khanacademy.org/math/algebra/solving-linear-equations-and-inequalities/absolute-value-equations/v/absolute-value-inequalities-example-1)  [**Absolute inequalities 2**](http://www.khanacademy.org/math/algebra/solving-linear-equations-and-inequalities/absolute-value-equations/v/absolute-inequalities-2)  [**Absolute value inequalities example 3**](http://www.khanacademy.org/math/algebra/solving-linear-equations-and-inequalities/absolute-value-equations/v/absolute-value-inequalities-example-3) |
| **Activity 2**  *Graphing to Find Solutions*  2-1 Learning Targets:   * Write equations in two variables to represent relationships between quantities. * Graph equations on coordinate axes with labels and scales.   2-2 Learning Targets:   * Represent constraints by equations or inequalities. * Use a graph to determine solutions of a system of inequalities. | ***Writing Linear Equations*** |
| [**Constructing linear equations to solve word problems**](http://www.khanacademy.org/math/algebra/linear-equations-and-inequalitie/equation-of-a-line/v/word-problem-solving-4) |
| ***Graphing and Interpreting Two-Variable Equations*** |
| [**Graphing a line in slope intercept form**](http://www.khanacademy.org/math/algebra/linear-equations-and-inequalitie/graphing-slope-intercept/v/graphing-a-line-in-slope-intercept-form)  [**Interpreting intercepts of linear functions**](http://www.khanacademy.org/math/algebra/linear-equations-and-inequalitie/graphing_with_intercepts/v/interpreting-intercepts-of-linear-functions) |
| ***Graphing Systems of Inequalities*** |
| [**Graphing systems of inequalities**](http://www.khanacademy.org/math/algebra2/systems_eq_ineq/systems_inequalities_precalc/v/graphing-systems-of-inequalities-2)  [**Graphing systems of inequalities 2**](http://www.khanacademy.org/math/algebra2/systems_eq_ineq/systems_inequalities_precalc/v/u06-l3-t1-we3-graphing-systems-of-inequalities)  [**Visualizing the solution set for a system of inequalities**](http://www.khanacademy.org/math/algebra2/systems_eq_ineq/systems_inequalities_precalc/v/graphical-system-of-inequalities) |
| **Activity 3**  *Systems of Linear Equations*  3-1 Learning Targets:   * Use graphing, substitution, and elimination to solve systems of linear equations in two variables. * Formulate systems of linear equations in two variables to model real-world situations.   3-2 Learning Targets:   * Solve systems of three linear equations in three variables using substitution and Gaussian elimination. * Formulate systems of three linear equations in three variables to model a real-world situation.   3-3 Learning Targets:   * Add, subtract, and multiply matrices. * Use a graphing calculator to perform operations on matrices.   3-4 Learning Targets:   * Solve systems of two linear equations in two variables by using graphing calculators with matrices. * Solve systems of three linear equations in three variables by using graphing calculators with matrices. | ***Solving Systems of Two Equations in Two Variables: Graphing*** |
| [**Solving linear systems by graphing**](http://www.khanacademy.org/math/algebra/systems-of-eq-and-ineq/systems-through-examples/v/solving-linear-systems-by-graphing)  [**Solving systems graphically**](http://www.khanacademy.org/math/algebra/systems-of-eq-and-ineq/systems-through-examples/v/solving-systems-graphically)  [**Graphing systems of equations**](http://www.khanacademy.org/math/algebra/systems-of-eq-and-ineq/systems-through-examples/v/graphings-systems-of-equations)  [**Graphical systems application problem**](http://www.khanacademy.org/math/algebra/systems-of-eq-and-ineq/systems-through-examples/v/graphical-systems-application-problem)  [**Example 2: Graphically solving systems**](http://www.khanacademy.org/math/algebra/systems-of-eq-and-ineq/systems-through-examples/v/solving-systems-by-graphing-2)  [**Example 3: Graphically solving systems**](http://www.khanacademy.org/math/algebra/systems-of-eq-and-ineq/systems-through-examples/v/solving-systems-by-graphing-3) |
| ***Solving Systems of Two Equations in Two Variables: Substitution*** |
| [**Example 1: Solving systems by substitution**](http://www.khanacademy.org/math/algebra/systems-of-eq-and-ineq/systems-with-substitution/v/solving-systems-by-substitution-1)  [**Example 2: Solving systems by substitution**](http://www.khanacademy.org/math/algebra/systems-of-eq-and-ineq/systems-with-substitution/v/solving-systems-by-substitution-2)  [**Example 3: Solving systems by substitution**](http://www.khanacademy.org/math/algebra/systems-of-eq-and-ineq/systems-with-substitution/v/solving-systems-by-substitution-3)  [**The substitution method**](http://www.khanacademy.org/math/algebra/systems-of-eq-and-ineq/systems-with-substitution/v/the-substitution-method)  [**Substitution method 2**](http://www.khanacademy.org/math/algebra/systems-of-eq-and-ineq/systems-with-substitution/v/substitution-method-2)  [**Substitution method 3**](http://www.khanacademy.org/math/algebra/systems-of-eq-and-ineq/systems-with-substitution/v/substitution-method-3)  [**Practice using substitution for systems**](http://www.khanacademy.org/math/algebra/systems-of-eq-and-ineq/systems-with-substitution/v/practice-using-substitution-for-systems) |
| ***Solving Systems of Two Equations in Two Variables: Elimination*** |
| [**Example 1: Solving systems by elimination**](http://www.khanacademy.org/math/algebra/systems-of-eq-and-ineq/solving-systems-addition-elimination/v/solving-systems-by-elimination)  [**Example 2: Solving systems by elimination**](http://www.khanacademy.org/math/algebra/systems-of-eq-and-ineq/solving-systems-addition-elimination/v/solving-systems-by-elimination-2)  [**Example 3: Solving systems by elimination**](http://www.khanacademy.org/math/algebra/systems-of-eq-and-ineq/solving-systems-addition-elimination/v/solving-systems-by-elimination-3)  [**Addition elimination method 1**](http://www.khanacademy.org/math/algebra/systems-of-eq-and-ineq/solving-systems-addition-elimination/v/addition-elimination-method-1)  [**Addition elimination method 2**](http://www.khanacademy.org/math/algebra/systems-of-eq-and-ineq/solving-systems-addition-elimination/v/addition-elimination-method-2)  [**Addition elimination method 3**](http://www.khanacademy.org/math/algebra/systems-of-eq-and-ineq/solving-systems-addition-elimination/v/addition-elimination-method-3)  [**Addition elimination method 4**](http://www.khanacademy.org/math/algebra/systems-of-eq-and-ineq/solving-systems-addition-elimination/v/addition-elimination-method-4)  [**Simple elimination practice**](http://www.khanacademy.org/math/algebra/systems-of-eq-and-ineq/solving-systems-addition-elimination/v/simple-elimination-practice)  [**Systems with elimination practice**](http://www.khanacademy.org/math/algebra/systems-of-eq-and-ineq/solving-systems-addition-elimination/v/systems-with-elimination-practice) |
| ***Consistent, Inconsistent, Dependent, and Independent Systems*** |
| [**Consistent and inconsistent systems**](http://www.khanacademy.org/math/algebra2/systems_eq_ineq/systems_tutorial_precalc/v/consistent-and-inconsistent-systems)  [**Independent and dependent systems**](http://www.khanacademy.org/math/algebra2/systems_eq_ineq/systems_tutorial_precalc/v/independent-and-dependent-systems) |
| ***Solving Systems of Three Equations in Three Variables*** |
| [**Systems of three variables**](http://www.khanacademy.org/math/algebra2/systems_eq_ineq/fancier_systems_precalc/v/systems-of-three-variables)  [**Systems of three variables 2**](http://www.khanacademy.org/math/algebra2/systems_eq_ineq/fancier_systems_precalc/v/systems-of-three-variables-2)  [**Solutions to three variable system**](http://www.khanacademy.org/math/algebra2/systems_eq_ineq/fancier_systems_precalc/v/solutions-to-three-variable-system)  [**Solutions to three variable system 2**](http://www.khanacademy.org/math/algebra2/systems_eq_ineq/fancier_systems_precalc/v/solutions-to-three-variable-system-2)  [**Three equation application problem**](http://www.khanacademy.org/math/algebra2/systems_eq_ineq/fancier_systems_precalc/v/three-equation-application-problem) |
| ***Matrix Operations*** |
| [**Introduction to the matrix**](http://www.khanacademy.org/math/algebra2/alg2-matrices/basic-matrix-operations-alg2/v/introduction-to-the-matrix)  [**Representing data with matrices**](http://www.khanacademy.org/math/algebra2/alg2-matrices/basic-matrix-operations-alg2/v/data-in-matrices)  [**Matrix addition and subtraction**](http://www.khanacademy.org/math/algebra2/alg2-matrices/basic-matrix-operations-alg2/v/matrix-addition-and-subtraction-1)  [**Matrix multiplication introduction**](http://www.khanacademy.org/math/algebra2/alg2-matrices/matrix-multiplication-alg2/v/matrix-multiplication-intro)  [**Multiplying a matrix by a matrix**](http://www.khanacademy.org/math/algebra2/alg2-matrices/matrix-multiplication-alg2/v/multiplying-a-matrix-by-a-matrix)  [**Defined and undefined matrix operations**](http://www.khanacademy.org/math/algebra2/alg2-matrices/matrix-multiplication-alg2/v/defined-and-undefined-matrix-operations) |
| ***Solving Matrix Equations*** |
| [**Matrix equations and systems**](http://www.khanacademy.org/math/precalculus/precalc-matrices/matrix-equations/v/matrix-equations-systems) |
| **Activity 4**  *Piecewise-Defined Functions*  4-1 Learning Targets:   * Graph piecewise-defined functions. * Write the domain and range of functions using interval notation, inequalities, and set notation.   4-2 Learning Targets:   * Graph step functions and absolute value functions. * Describe the attributes of these functions.   4-3 Learning Targets:   * Identify the effect on the graph of replacing f(x) by f(x) + k, k · f(x), f(kx), and f(x + k). * Find the value of k, given these graphs. | ***Piecewise Defined Functions*** |
| [**What is a function?**](http://www.khanacademy.org/math/algebra2/functions_and_graphs/piecewise-functions-tutorial/v/what-is-a-function)  [**Finding a piecewise function definition from graph**](http://www.khanacademy.org/math/algebra2/functions_and_graphs/piecewise-functions-tutorial/v/finding-a-piecewise-function-definition-from-graph) |
| ***Absolute Value Functions*** |
| [**Graphs of absolute value functions**](http://www.khanacademy.org/math/algebra2/functions_and_graphs/piecewise-functions-tutorial/v/graphs-of-absolute-value-functions)  [**Absolute value graphing exercise example**](http://www.khanacademy.org/math/algebra2/functions_and_graphs/piecewise-functions-tutorial/v/absolute-value-graphing-exercise-example) |
| **Activity 5**  *Function Composition and Operations*  5-1 Learning Targets:   * Combine functions using arithmetic operations. * Build functions that model real-world scenarios.   5-2 Learning Targets:   * Write functions that describe the relationship between two quantities. * Explore the composition of two functions through a real-world scenario.   5-3 Learning Targets:   * Write the composition of two functions. * Evaluate the composition of two functions. | ***Operations with Functions*** |
| [**Sum of functions**](http://www.khanacademy.org/math/algebra2/functions_and_graphs/function_expressions/v/sum-of-functions)  [**Difference of functions**](http://www.khanacademy.org/math/algebra2/functions_and_graphs/function_expressions/v/difference-of-functions)  [**Product of functions**](http://www.khanacademy.org/math/algebra2/functions_and_graphs/function_expressions/v/product-of-functions)  [**Quotient of functions**](http://www.khanacademy.org/math/algebra2/functions_and_graphs/function_expressions/v/quotient-of-functions) |
| ***Composition of Functions*** |
| [**Introduction to function composition**](http://www.khanacademy.org/math/algebra2/functions_and_graphs/composing-functions/v/function-composition)  [**Creating new function from composition**](http://www.khanacademy.org/math/algebra2/functions_and_graphs/composing-functions/v/new-function-from-composition)  [**Evaluating composite functions example**](http://www.khanacademy.org/math/algebra2/functions_and_graphs/composing-functions/v/evaluating-composite-functions-example-1)  [**Modeling with function composition**](http://www.khanacademy.org/math/algebra2/functions_and_graphs/composing-functions/v/modeling-with-composite-functions) |
| **Activity 6**  *Inverse Functions*  6-1 Learning Targets:   * Find the inverse of a function. * Write the inverse using the proper notation.   6-2 Learning Targets:   * Use composition of functions to determine if functions are inverses of each other. * Graph inverse functions and identify the symmetry. | ***Inverse Functions*** |
| [**Introduction to function inverses**](http://www.khanacademy.org/math/algebra2/functions_and_graphs/function_inverses_2/v/introduction-to-function-inverses)  [**Introduction to the inverse of a function**](http://www.khanacademy.org/math/algebra2/functions_and_graphs/mathy-functions/v/linear-algebra-introduction-to-the-inverse-of-a-function)  [**Function inverse example 1**](http://www.khanacademy.org/math/algebra2/functions_and_graphs/function_inverses_2/v/function-inverse-example-1)  [**Function inverses example 2**](http://www.khanacademy.org/math/algebra2/functions_and_graphs/function_inverses_2/v/function-inverses-example-2)  [**Function inverses example 3**](http://www.khanacademy.org/math/algebra2/functions_and_graphs/function_inverses_2/v/function-inverses-example-3) |
| **Unit 2: Quadratic Functions** | |
| **Activity 7**  *Applications of Quadratic Functions*  7-1 Learning Targets:   * Formulate quadratic functions in a problem-solving situation. * Graph and interpret quadratic functions.   7-2 Learning Targets:   * Factor quadratic expressions of the form x2 + bx + c. * Factor quadratic expressions of the form ax2 + bx + c.   7-3 Learning Targets:   * Solve quadratic equations by factoring. * Interpret solutions of a quadratic equation. * Create quadratic equations from solutions.   7-4 Learning Targets:   * Solve quadratic inequalities. * Graph the solutions to quadratic inequalities. | ***Analyzing a Quadratic Function*** |
| [**Graphing a parabola with a table of values**](http://www.khanacademy.org/math/algebra/quadratics/solving_graphing_quadratics/v/graphing-a-quadratic-function)  [**Parabola vertex and axis of symmetry**](http://www.khanacademy.org/math/algebra/quadratics/solving_graphing_quadratics/v/quadratic-functions-2)  [**Finding the vertex of a parabola example**](http://www.khanacademy.org/math/algebra/quadratics/solving_graphing_quadratics/v/finding-the-vertex-of-a-parabola-example)  [**Graphing a parabola by finding the roots and vertex**](http://www.khanacademy.org/math/algebra/quadratics/solving_graphing_quadratics/v/quadratic-functions-3)  [**Graphing a parabola using roots and vertex**](http://www.khanacademy.org/math/algebra/quadratics/solving_graphing_quadratics/v/graphing-a-parabola-using-roots-and-vertex)  [**Multiple examples graphing parabolas using roots and vertices**](http://www.khanacademy.org/math/algebra/quadratics/solving_graphing_quadratics/v/graphs-of-quadratic-functions) |
| ***Factoring Quadratic Expressions*** |
| [**Factoring quadratic expressions**](http://www.khanacademy.org/math/algebra/multiplying-factoring-expression/factoring-quadratic-expressions/v/factoring-quadratic-expressions)  [**Examples: Factoring simple quadratics**](http://www.khanacademy.org/math/algebra/multiplying-factoring-expression/factoring-quadratic-expressions/v/factoring-polynomials-1)  [**Example 1: Factoring quadratic expressions**](http://www.khanacademy.org/math/algebra/multiplying-factoring-expression/factoring-quadratic-expressions/v/factoring-trinomials-with-a-leading-1-coefficient)  [**Example 1: Factoring trinomials with a common factor**](http://www.khanacademy.org/math/algebra/multiplying-factoring-expression/factoring-quadratic-expressions/v/factoring-trinomials-with-a-common-factor) |
| ***Solving Quadratic Equations by Factoring*** |
| [**Solving a quadratic equation by factoring**](http://www.khanacademy.org/math/algebra/quadratics/factoring_quadratics/v/example-1-solving-a-quadratic-equation-by-factoring)  [**Dimensions from volume of box**](http://www.khanacademy.org/math/algebra/quadratics/factoring_quadratics/v/example-3-solving-a-quadratic-equation-by-factoring) |
| ***More Uses for Factors*** |
| [**Quadratic inequalities**](http://www.khanacademy.org/math/algebra2/polynomial_and_rational/quad_ineq/v/quadratic-inequalities)  [**Quadratic inequalities (visual explanation)**](http://www.khanacademy.org/math/algebra2/polynomial_and_rational/quad_ineq/v/quadratic-inequalities-visual-explanation) |
| **Activity 8**  *Introduction to Complex Numbers*  8-1 Learning Targets:   * Know the definition of the complex number i. * Know that complex numbers can be written as a + bi, where a and b are real numbers. * Graph complex numbers on the complex plane.   8-2 Learning Targets:   * Add and subtract complex numbers. * Multiply and divide complex numbers.   8-3 Learning Targets:   * Factor quadratic expressions using complex conjugates. * Solve quadratic equations with complex roots by factoring. | ***The Imaginary Unit , i*** |
| [**Introduction to i and imaginary numbers**](http://www.khanacademy.org/math/algebra2/complex-numbers-a2/imaginary_unit_i-a2/v/introduction-to-i-and-imaginary-numbers)  [**Imaginary roots of negative numbers**](http://www.khanacademy.org/math/algebra2/complex-numbers-a2/imaginary_unit_i-a2/v/imaginary-roots-of-negative-numbers)  [**i as the principal root of -1 (a little technical)**](http://www.khanacademy.org/math/algebra2/complex-numbers-a2/imaginary_unit_i-a2/v/i-as-the-principal-root-of-1-a-little-technical)  [**Plotting complex numbers on the complex plane**](http://www.khanacademy.org/math/algebra2/complex-numbers-a2/complex_numbers/v/plotting-complex-numbers-on-the-complex-plane) |
| ***Operations with Complex Numbers*** |
| [**Calculating i raised to arbitrary exponents**](http://www.khanacademy.org/math/algebra2/complex-numbers-a2/imaginary_unit_i-a2/v/calculating-i-raised-to-arbitrary-exponents)  [**Adding complex numbers**](http://www.khanacademy.org/math/algebra2/complex-numbers-a2/complex_numbers/v/adding-complex-numbers)  [**Subtracting complex numbers**](http://www.khanacademy.org/math/algebra2/complex-numbers-a2/complex_numbers/v/subtracting-complex-numbers)  [**Multiplying complex numbers**](http://www.khanacademy.org/math/algebra2/complex-numbers-a2/complex_numbers/v/multiplying-complex-numbers)  [**Complex conjugates example**](http://www.khanacademy.org/math/algebra2/complex-numbers-a2/complex_numbers/v/complex-conjugates-example)  [**Dividing complex numbers**](http://www.khanacademy.org/math/algebra2/complex-numbers-a2/complex_numbers/v/dividing-complex-numbers) |
| **Activity 9**  *Solving ax*2+ *bx* + *c* =0  9-1 Learning Targets:   * Solve quadratic equations by taking square roots. * Solve quadratic equations ax2 + bx + c = 0 by completing the square.   9-2 Learning Targets:   * Derive the Quadratic Formula. * Solve quadratic equations using the Quadratic Formula.   9-3 Learning Targets:   * Solve quadratic equations using the Quadratic Formula. * Use the discriminant to determine the nature of the solutions of a quadratic equation. | ***Completing the Square and Taking Square Roots*** |
| [**Solve quadratic equations by square roots**](http://www.khanacademy.org/math/algebra2/polynomial_and_rational/quad_formula_tutorial/v/solving-quadratic-equations-by-square-roots)  [**Solving quadratic equations by completing the square**](http://www.khanacademy.org/math/algebra/quadratics/completing_the_square/v/solving-quadratic-equations-by-completing-the-square)  [**Example 1: Completing the square**](http://www.khanacademy.org/math/algebra/quadratics/completing_the_square/v/ex1-completing-the-square)  [**Example 2: Completing the square**](http://www.khanacademy.org/math/algebra/quadratics/completing_the_square/v/ex2-completing-the-square)  [**Example 3: Completing the square**](http://www.khanacademy.org/math/algebra/quadratics/completing_the_square/v/completing-the-square-to-solve-quadratic-equations) |
| ***The Quadratic Formula*** |
| [**Proof of quadratic formula**](http://www.khanacademy.org/math/algebra2/polynomial_and_rational/quad_formula_tutorial/v/proof-of-quadratic-formula)  [**How to use the quadratic formula**](http://www.khanacademy.org/math/algebra2/polynomial_and_rational/quad_formula_tutorial/v/using-the-quadratic-formula) |
| ***Solutions of Quadratic Equations*** |
| [**Example: Complex roots for a quadratic**](http://www.khanacademy.org/math/algebra2/polynomial_and_rational/quad_formula_tutorial/v/complex-roots-from-the-quadratic-formula)  [**Discriminant of quadratic equations**](http://www.khanacademy.org/math/algebra2/polynomial_and_rational/quad_formula_tutorial/v/discriminant-of-quadratic-equations)  [**Discriminant for types of solutions for a quadratic**](http://www.khanacademy.org/math/algebra2/polynomial_and_rational/quad_formula_tutorial/v/discriminant-for-types-of-solutions-for-a-quadratic) |
| **Activity 10**  *Writing Quadratic Equations*  10-1 Learning Targets:   * Derive a general equation for a parabola based on the definition of a parabola. * Write the equation of a parabola given a graph and key features.   10-2 Learning Targets:   * Explain why three points are needed to determine a parabola. * Determine the quadratic function that passes through three given points on a plane.   10-3 Learning Targets:   * Find a quadratic model for a given table of data. * Use a quadratic model to make predictions. | ***Parabolas and Quadratic Equations*** |
| [**Parabola intuition example 1**](http://www.khanacademy.org/math/algebra2/conics_precalc/parabolas_precalc/v/parabola-intuition-example-1)  [**Focus and directrix introduction**](http://www.khanacademy.org/math/algebra2/conics_precalc/parabolas_precalc/v/focus-and-directrix-introduction) |
| ***Writing the Equation of a Parabola*** |
| [**Using the focus and directrix to find the equation of a parabola**](http://www.khanacademy.org/math/algebra2/conics_precalc/parabolas_precalc/v/using-the-focus-and-directrix-to-find-the-equation-of-a-parabola)  [**Equation for parabola from focus and directrix**](http://www.khanacademy.org/math/algebra2/conics_precalc/parabolas_precalc/v/equation-for-parabola-from-focus-and-directrix)  [**Finding focus and directrix from vertex**](http://www.khanacademy.org/math/algebra2/conics_precalc/parabolas_precalc/v/finding-focus-and-directrix-from-vertex) |
| **Activity 11**  *Transformations of y* = *x*2  11-1 Learning Targets:   * Describe translations of the parent function f(x) = x2. * Given a translation of the function f(x) = x2, write the equation of the function.   11-2 Learning Targets:   * Describe transformations of the parent function f(x) = x2. * Given a transformation of the function f(x) = x2, write the equation of the function.   11-3 Learning Targets:   * Write a quadratic function in vertex form. * Use transformations to graph a quadratic function in vertex form. | *Transformations of y* = *x*2 |
| [**Shifting and scaling parabolas**](http://www.khanacademy.org/math/algebra/quadratics/solving_graphing_quadratics/v/shifting-and-scaling-parabolas)  [**Graphing a parabola in vertex form**](http://www.khanacademy.org/math/algebra/quadratics/solving_graphing_quadratics/v/graphing-a-parabola-in-vertex-form) |
| **Activity 12**  *Graphing Quadratics and Quadratic Inequalities*  12-1 Learning Targets:   * Write a quadratic function from a verbal description. * Identify and interpret key features of the graph of a quadratic function.   12-2 Learning Targets:   * Write a quadratic function from a verbal description. * Identify and interpret key features of the graph of a quadratic function.   12-3 Learning Targets:   * Identify key features of a quadratic function from an equation written in standard form. * Use key features to graph a quadratic function.   12-4 Learning Targets:   * Use the discriminant to determine the nature of the solutions of a quadratic equation. * Use the discriminant to help graph a quadratic function.   12-5 Learning Targets:   * Graph a quadratic inequality in two variables. * Determine the solutions to a quadratic inequality by graphing. | ***Key Features of Quadratic Functions*** |
| [**Parabola vertex and axis of symmetry**](http://www.khanacademy.org/math/algebra/quadratics/solving_graphing_quadratics/v/quadratic-functions-2) |
| ***Graphing Quadratic Functions*** |
| [**Examples: Graphing and interpreting quadratics**](http://www.khanacademy.org/math/algebra/quadratics/quadratic_odds_ends/v/algebra-ii-shifting-quadratic-graphs)  [**Graphing a parabola with a table of values**](http://www.khanacademy.org/math/algebra/quadratics/solving_graphing_quadratics/v/graphing-a-quadratic-function)  [**Finding the vertex of a parabola example**](http://www.khanacademy.org/math/algebra/quadratics/solving_graphing_quadratics/v/finding-the-vertex-of-a-parabola-example)  [**Graphing a parabola by finding the roots and vertex**](http://www.khanacademy.org/math/algebra/quadratics/solving_graphing_quadratics/v/quadratic-functions-3)  [**Graphing a parabola using roots and vertex**](http://www.khanacademy.org/math/algebra/quadratics/solving_graphing_quadratics/v/graphing-a-parabola-using-roots-and-vertex)  [**Multiple examples graphing parabolas using roots and vertices**](http://www.khanacademy.org/math/algebra/quadratics/solving_graphing_quadratics/v/graphs-of-quadratic-functions) |
| The Discriminant |
| [**Discriminant of quadratic equations**](http://www.khanacademy.org/math/algebra2/polynomial_and_rational/quad_formula_tutorial/v/discriminant-of-quadratic-equations)  [**Discriminant for types of solutions for a quadratic**](http://www.khanacademy.org/math/algebra2/polynomial_and_rational/quad_formula_tutorial/v/discriminant-for-types-of-solutions-for-a-quadratic) |
| **Activity 13**  *Systems of Linear and Nonlinear Equations*  13-1 Learning Targets:   * Use graphing to solve a system consisting of a linear and a nonlinear equation. * Interpret the solutions of a system of equations.   13-2 Learning Targets:   * Use substitution to solve a system consisting of a linear and nonlinear equation. * Determine when a system consisting of a linear and nonlinear equation has no solution. | ***Systems of Nonlinear Equations*** |
| [**Non-linear systems of equations 1**](http://www.khanacademy.org/math/algebra2/systems_eq_ineq/non-linear-systems-tutorial/v/non-linear-systems-of-equations-1)  [**Non-linear systems of equations 2**](http://www.khanacademy.org/math/algebra2/systems_eq_ineq/non-linear-systems-tutorial/v/non-linear-systems-of-equations-1)  [**Non-linear systems of equations 3**](http://www.khanacademy.org/math/algebra2/systems_eq_ineq/non-linear-systems-tutorial/v/non-linear-systems-of-equations-3)  [**Systems of nonlinear equations 1**](http://www.khanacademy.org/math/algebra2/systems_eq_ineq/non-linear-systems-tutorial/v/systems-of-nonlinear-equations-1)  [**Systems of nonlinear equations 2**](http://www.khanacademy.org/math/algebra2/systems_eq_ineq/non-linear-systems-tutorial/v/systems-of-nonlinear-equations-2)  [**Systems of nonlinear equations 3**](http://www.khanacademy.org/math/algebra2/systems_eq_ineq/non-linear-systems-tutorial/v/systems-of-nonlinear-equations-3) |
| **Unit 3: Polynomials** | |
| **Activity 14**  *Introduction to Polynomials*  14-1 Learning Targets:   * Write a third-degree equation that represents a real-world situation. * Graph a portion of this equation and evaluate the meaning of a relative maximum.   14-2 Learning Targets:   * Sketch the graphs of cubic functions. * Identify the end behavior of polynomial functions.   14-3 Learning Targets:   * Recognize even and odd functions given an equation or graph. * Distinguish between even and odd functions and even-degree and odd-degree functions. | ***Polynomial Basics*** |
| [**Terms coefficients and exponents in a polynomial**](http://www.khanacademy.org/math/algebra-basics/quadratics-polynomials-topic/polynomial-basics-core-algebra/v/terms-coefficients-and-exponents-in-a-polynomial) |
| ***End Behavior Of Polynomial Functions*** |
| [**Polynomial end behavior**](http://www.khanacademy.org/math/algebra2/polynomial_and_rational/polynomial-end-behavior/v/polynomial-end-behavior)  [**Polynomial end behavior example**](http://www.khanacademy.org/math/algebra2/polynomial_and_rational/polynomial-end-behavior/v/polynomial-end-behavior-example)  [**Another polynomial end behavior example**](http://www.khanacademy.org/math/algebra2/polynomial_and_rational/polynomial-end-behavior/v/another-polynomial-end-behavior-example)  [**Polynomial end behavior exercise example**](http://www.khanacademy.org/math/algebra2/polynomial_and_rational/polynomial-end-behavior/v/polynomial-end-behavior-exercise-example) |
| ***Even and Odd Functions*** |
| [**Recognizing odd and even functions**](http://www.khanacademy.org/math/algebra2/functions_and_graphs/analyzing_functions/v/recognizing-odd-and-even-functions)  [**Connection between even and odd numbers and functions**](http://www.khanacademy.org/math/algebra2/functions_and_graphs/analyzing_functions/v/connection-between-even-and-odd-numbers-and-functions) |
| **Activity 15**  *Polynomial Operations*  15-1 Learning Targets:   * Use a real-world scenario to introduce polynomial addition and subtraction. * Add and subtract polynomials.   15-2 Learning Targets:   * Add, subtract, and multiply polynomials. * Understand that polynomials are closed under the operations of addition, subtraction, and multiplication.   15-3 Learning Targets:   * Determine the quotient of two polynomials. * Prove a polynomial identity and use it to describe numerical relationships. | ***Adding and Subtraction Polynomials*** |
| [**Addition and subtraction of polynomials**](http://www.khanacademy.org/math/algebra2/polynomial_and_rational/polynomial_tutorial/v/addition-and-subtraction-of-polynomials) |
| ***Multiplying Polynomials*** |
| [**Multiplying polynomials example**](http://www.khanacademy.org/math/algebra2/polynomial_and_rational/polynomial_tutorial/v/multiplying-polynomials)  [**Multiplying polynomials example 2**](http://www.khanacademy.org/math/algebra2/polynomial_and_rational/polynomial_tutorial/v/multiplying-polynomials-3) |
| ***Dividing Polynomials*** |
| [**Polynomial division**](http://www.khanacademy.org/math/algebra2/polynomial_and_rational/dividing_polynomials/v/polynomial-division)  [**Polynomial divided by monomial**](http://www.khanacademy.org/math/algebra2/polynomial_and_rational/dividing_polynomials/v/polynomial-divided-by-monomial)  [**Dividing polynomials 1**](http://www.khanacademy.org/math/algebra2/polynomial_and_rational/dividing_polynomials/v/dividing-polynomials-1)  [**Dividing polynomials with remainders**](http://www.khanacademy.org/math/algebra2/polynomial_and_rational/dividing_polynomials/v/dividing-polynomials-with-remainders)  [**Dividing polynomials with remainders example**](http://www.khanacademy.org/math/algebra2/polynomial_and_rational/dividing_polynomials/v/dividing-polynomials-with-remainders-example) |
| **Activity 16**  *Binomial Theorem*  16-1 Learning Targets:   * Find the number of combinations of an event. * Create Pascal’s triangle.   16-2 Learning Targets:   * Know the Binomial Theorem. * Apply the Binomial Theorem to identify the coefficients or terms of any binomial expansion. | ***Pascal’s Triangle*** |
| [**Pascal’s triangle for binomial expansion**](http://www.khanacademy.org/math/algebra2/polynomial_and_rational/binomial_theorem/v/pascals-triangle-binomial-theorem) |
| ***Binomial Theorem*** |
| [**Binomial theorem**](http://www.khanacademy.org/math/algebra2/polynomial_and_rational/binomial_theorem/v/binomial-theorem)  [**Determining coefficient in binomial expansion**](http://www.khanacademy.org/math/algebra2/polynomial_and_rational/binomial_theorem/v/coefficient-in-binomial-expansion)  [**Connecting Pascal’s triangle to binomial combinatorics**](http://www.khanacademy.org/math/algebra2/polynomial_and_rational/binomial_theorem/v/binomial-theorem-intuition)  [**Algorithm for mentally computing binomial expansion coefficients**](http://www.khanacademy.org/math/algebra2/polynomial_and_rational/binomial_theorem/v/binomial-expansion-algorithm)  [**Binomial theorem combinatorics connection**](http://www.khanacademy.org/math/algebra2/polynomial_and_rational/binomial_theorem/v/binomial-theorem-part-3) |
| **Activity 17**  *Factors of Polynomials*  17-1 Learning Targets:   * Determine the linear factors of polynomial functions using algebraic methods. * Determine the linear or quadratic factors of polynomials by factoring the sum or difference of two cubes and factoring by grouping.   17-2 Learning Targets:   * Know and apply the Fundamental Theorem of Algebra. * Write polynomial functions, given their degree and roots. | ***Factoring Polynomials: Algebraic Methods*** |
| [**Factor by grouping and factoring completely**](http://www.khanacademy.org/math/algebra/multiplying-factoring-expression/factoring-by-grouping/v/factor-by-grouping-and-factoring-completely)  [**Example: basic grouping**](http://www.khanacademy.org/math/algebra/multiplying-factoring-expression/factoring-by-grouping/v/factoring-trinomials-by-grouping-1)  [**Example 1: Factoring by grouping**](http://www.khanacademy.org/math/algebra/multiplying-factoring-expression/factoring-by-grouping/v/factoring-trinomials-with-a-non-1-leading-coefficient-by-grouping)  [**Example 2: Factoring by grouping**](http://www.khanacademy.org/math/algebra/multiplying-factoring-expression/factoring-by-grouping/v/ex2-factoring-quad)  [**Example 3: Factoring by grouping**](http://www.khanacademy.org/math/algebra/multiplying-factoring-expression/factoring-by-grouping/v/u09-l1-t2-we3-factoring-trinomials)  [**Example 4: Factoring by grouping**](http://www.khanacademy.org/math/algebra/multiplying-factoring-expression/factoring-by-grouping/v/factoring-trinomials-by-grouping-4)  [**Example 5: Factoring by grouping**](http://www.khanacademy.org/math/algebra/multiplying-factoring-expression/factoring-by-grouping/v/factoring-trinomials-by-grouping-5)  [**Example 6: Factoring by grouping**](http://www.khanacademy.org/math/algebra/multiplying-factoring-expression/factoring-by-grouping/v/factoring-trinomials-by-grouping-6)  [**Difference of cubes factoring**](http://www.khanacademy.org/math/algebra2/polynomial_and_rational/factoring-higher-deg-polynomials/v/difference-of-cubes-factoring)  [**Factoring sum of cubes**](http://www.khanacademy.org/math/algebra2/polynomial_and_rational/factoring-higher-deg-polynomials/v/factoring-sum-of-cubes) |
| ***The Fundamental Theorem of Algebra*** |
| [**Fundamental theorem of algebra**](http://www.khanacademy.org/math/algebra2/polynomial_and_rational/fundamental-theorem-of-algebra/v/fundamental-theorem-of-algebra-intro)  [**Fundamental theorem of algebra for quadratic**](http://www.khanacademy.org/math/algebra2/polynomial_and_rational/fundamental-theorem-of-algebra/v/fundamental-theorem-algebra-quadratic)  [**Possible number of real roots**](http://www.khanacademy.org/math/algebra2/polynomial_and_rational/fundamental-theorem-of-algebra/v/possible-real-roots) |
| **Activity 18**  *Graphs of Polynomials*  18-1 Learning Targets:   * Graph polynomial functions by hand or using technology, identifying zeros when suitable factorizations are available, and showing end behavior. * Recognize even and odd functions from their algebraic expressions.   18-2 Learning Targets:   * Know and apply the Rational Root Theorem and Descartes’ Rule of Signs. * Know and apply the Remainder Theorem and the Factor Theorem.   18-3 Learning Targets:   * Compare properties of two functions each represented in a different way. * Solve polynomial inequalities by graphing. | ***Graphing Polynomial Functions*** |
| [**Polynomial end behavior**](http://www.khanacademy.org/math/algebra2/polynomial_and_rational/polynomial-end-behavior/v/polynomial-end-behavior)  [**Polynomial end behavior example**](http://www.khanacademy.org/math/algebra2/polynomial_and_rational/polynomial-end-behavior/v/polynomial-end-behavior-example)  [**Another polynomial end behavior example**](http://www.khanacademy.org/math/algebra2/polynomial_and_rational/polynomial-end-behavior/v/another-polynomial-end-behavior-example)  [**Polynomial end behavior exercise example**](http://www.khanacademy.org/math/algebra2/polynomial_and_rational/polynomial-end-behavior/v/polynomial-end-behavior-exercise-example)  [**Recognizing odd and even functions**](http://www.khanacademy.org/math/algebra2/functions_and_graphs/analyzing_functions/v/recognizing-odd-and-even-functions)  [**Connection between even and odd numbers and functions**](http://www.khanacademy.org/math/algebra2/functions_and_graphs/analyzing_functions/v/connection-between-even-and-odd-numbers-and-functions) |
| ***Finding the Roots of a Polynomial Function*** |
| [**Synthetic division**](http://www.khanacademy.org/math/algebra2/polynomial_and_rational/synthetic-division/v/synthetic-division)  [**Synthetic division example 2**](http://www.khanacademy.org/math/algebra2/polynomial_and_rational/synthetic-division/v/synthetic-division-example-2)  [**Why synthetic division works**](http://www.khanacademy.org/math/algebra2/polynomial_and_rational/synthetic-division/v/why-synthetic-division-works)  [**Polynomial remainder theorem**](http://www.khanacademy.org/math/algebra2/polynomial_and_rational/polynomial-remainder-theorem-tutorial/v/polynomial-remainder-theorem)  [**Polynomial remainder theorem example**](http://www.khanacademy.org/math/algebra2/polynomial_and_rational/polynomial-remainder-theorem-tutorial/v/polynomial-remainder-theorem-example)  [**Polynomial remainder theorem to test factor**](http://www.khanacademy.org/math/algebra2/polynomial_and_rational/polynomial-remainder-theorem-tutorial/v/polynomial-remainder-theorem-to-test-factor)  [**Polynomial remainder theorem proof**](http://www.khanacademy.org/math/algebra2/polynomial_and_rational/polynomial-remainder-theorem-tutorial/v/polynomial-remainder-theorem-proof) |
| ***Comparing Polynomial Functions*** |
| [**Recognizing features of functions (example 1)**](http://www.khanacademy.org/math/algebra2/functions_and_graphs/analyzing_functions/v/recognizing-features-of-functions-example-1)  [**Recognizing features of functions (example 2)**](http://www.khanacademy.org/math/algebra2/functions_and_graphs/analyzing_functions/v/recognizing-features-of-functions-2-example-2)  [**Recognizing features of functions (example 3)**](http://www.khanacademy.org/math/algebra2/functions_and_graphs/analyzing_functions/v/recognizing-features-of-functions-2-example-3) |
| **Unit 4: Series, Exponential and Logarithmic Functions** | |
| **Activity 19**  *Arithmetic Sequences and Series*  19-1 Learning Targets:   * Determine whether a given sequence is arithmetic. * Find the common difference of an arithmetic sequence. * Write an expression for an arithmetic sequence, and calculate the nth term.   19-2 Learning Targets:   * Write a formula for the nth partial sum of an arithmetic series. * Calculate partial sums of an arithmetic series.   19-3 Learning Targets:   * Identify the index, lower and upper limits, and general term in sigma notation. * Express the sum of a series using sigma notation. * Find the sum of a series written in sigma notation. | ***Arithmetic Sequences*** |
| [**Explicit and recursive definitions of sequences**](http://www.khanacademy.org/math/precalculus/seq_induction/seq_and_series/v/explicit-and-recursive-definitions-of-sequences)  [**Arithmetic sequences**](http://www.khanacademy.org/math/precalculus/seq_induction/seq_and_series/v/arithmetic-sequences)  [**Finding the 100th term in a sequence**](http://www.khanacademy.org/math/precalculus/seq_induction/seq_and_series/v/finding-the-100th-term-in-a-sequence)  [**Equations of sequence patterns**](http://www.khanacademy.org/math/precalculus/seq_induction/seq_and_series/v/equations-of-sequence-patterns) |
| ***Arithmetic Series*** |
| [**Explicitly defining a series**](http://www.khanacademy.org/math/integral-calculus/sequences_series_approx_calc/calculus-series/v/explicitly-defining-series) |
| ***Sigma Notation*** |
| [**Sigma notation for sums**](http://www.khanacademy.org/math/precalculus/seq_induction/geometric-sequence-series/v/sigma-notation-sum)  [**Writing a series in sigma notation**](http://www.khanacademy.org/math/integral-calculus/sequences_series_approx_calc/calculus-series/v/writing-series-sigma-notation) |
| **Activity 20**  *Geometric Sequences and Series*  20-1 Learning Targets:   * Identify the index, lower and upper limits, and general term in sigma notation. * Express the sum of a series using sigma notation. * Find the sum of a series written in sigma notation.   20-2 Learning Targets:   * Derive the formula for the sum of a finite geometric series. * Calculate the partial sums of a geometric series.   20-3 Learning Targets:   * Determine if an infinite geometric sum converges. * Find the sum of a convergent geometric series. | ***Geometric Sequences*** |
| [**Geometric sequences introduction**](http://www.khanacademy.org/math/precalculus/seq_induction/precalc-geometric-sequences/v/geometric-sequences-introduction)  [**Geometric sequences**](http://www.khanacademy.org/math/precalculus/seq_induction/precalc-geometric-sequences/v/geometric-sequences) |
| ***Geometric Series*** |
| [**Series as sum of sequence**](http://www.khanacademy.org/math/precalculus/seq_induction/seq_and_series/v/series-as-sum-of-sequence)  [**Geometric series**](http://www.khanacademy.org/math/precalculus/seq_induction/geometric-sequence-series/v/geometric-series-introduction)  [**Formula for a finite geometric series**](http://www.khanacademy.org/math/integral-calculus/sequences_series_approx_calc/seq_series_review/v/geometric-series)  [**Sum of an infinite geometric series**](http://www.khanacademy.org/math/integral-calculus/sequences_series_approx_calc/seq_series_review/v/infinite-geometric-series)  [**Another derivation of the sum of an infinite geometric series**](http://www.khanacademy.org/math/integral-calculus/sequences_series_approx_calc/seq_series_review/v/deriving-geometric-series-sum-formula) |
| ***Convergence and Divergence*** |
| [**Geometric series convergence and divergence examples**](http://www.khanacademy.org/math/integral-calculus/sequences_series_approx_calc/seq_series_review/v/geometric-series-convergence-divergence) |
| **Activity 21**  *Exponential Functions and Graphs*  21-1 Learning Targets:   * Identify data that grow exponentially. * Compare the rates of change of linear and exponential data.   21-2 Learning Targets:   * Identify and write exponential functions. * Determine the decay factor or growth factor of an exponential function.   21-3 Learning Targets:   * Determine when an exponential function is increasing or decreasing. * Describe the end behavior of exponential functions. * Identify asymptotes of exponential functions.   21-4 Learning Targets:   * Explore how changing parameters affects the graph of an exponential function. * Graph transformations of exponential functions.   21-5 Learning Targets:   * Graph the function f(x) = ex. * Graph transformations of f(x) = ex. | ***Exponential Functions*** |
| [**Understanding linear and exponential models**](http://www.khanacademy.org/math/algebra2/exponential_and_logarithmic_func/exp_growth_decay/v/linear-exponential-models)  [**Exponential growth and decay word problems**](http://www.khanacademy.org/math/algebra2/exponential_and_logarithmic_func/exponential-modeling/v/word-problem-solving-exponential-growth-and-decay)  [**Decay of cesium 137 example**](http://www.khanacademy.org/math/algebra2/exponential_and_logarithmic_func/exponential-modeling/v/decay-of-cesium-137-example)  [**Modeling ticket fines with exponential function**](http://www.khanacademy.org/math/algebra2/exponential_and_logarithmic_func/exponential-modeling/v/modeling-ticket-fines-with-exponential-function) |
| ***Graphs of Exponential Functions*** |
| [**Graphing exponential functions**](http://www.khanacademy.org/math/algebra2/exponential_and_logarithmic_func/exp_growth_decay/v/graphing-exponential-functions)  [**Constructing linear and exponential functions from graphs**](http://www.khanacademy.org/math/algebra2/exponential_and_logarithmic_func/exp_growth_decay/v/constructing-linear-and-exponential-functions-from-graph) |
| **Activity 22**  *Logarithms and Their Properties*  22-1 Learning Targets:   * Complete tables and plot points for exponential data. * Write and graph an exponential function for a given context. * Find the domain and range of an exponential function.   22-2 Learning Targets:   * Use technology to graph y = log x. * Evaluate a logarithm using technology. * Rewrite exponential equations as their corresponding logarithmic equations. * Rewrite logarithmic equations as their corresponding exponential equations.   22-3 Learning Targets:   * Make conjectures about properties of logarithms. * Write and apply the Product Property and Quotient Property of Logarithms. * Rewrite logarithmic expressions by using properties.   22-4 Learning Targets:   * Make conjectures about properties of logarithms. * Write and apply the Power Property of Logarithms. * Rewrite logarithmic expressions by using their properties. | ***Exponential Functions*** |
| [**Graphing exponential functions**](http://www.khanacademy.org/math/algebra2/exponential_and_logarithmic_func/exp_growth_decay/v/graphing-exponential-functions)  [**Constructing linear and exponential functions from data**](http://www.khanacademy.org/math/algebra2/exponential_and_logarithmic_func/exp_growth_decay/v/constructing-linear-and-exponential-functions-from-data)  [**Matching functions to their graphs**](http://www.khanacademy.org/math/algebra2/exponential_and_logarithmic_func/log_functions/v/matching-exponential-functions) |
| ***Logarithms*** |
| [**Logarithms**](http://www.khanacademy.org/math/algebra2/logarithms-tutorial/logarithm_basics/v/logarithms)  [**Writing in logarithmic and exponential form**](http://www.khanacademy.org/math/algebra2/logarithms-tutorial/logarithm_basics/v/exponential-to-logarithmic-form)  [**Introduction to logarithm properties**](http://www.khanacademy.org/math/algebra2/logarithms-tutorial/logarithm_properties/v/introduction-to-logarithm-properties)  [**Introduction to logarithm properties (part 2)**](http://www.khanacademy.org/math/algebra2/logarithms-tutorial/logarithm_properties/v/introduction-to-logarithm-properties-part-2) |
| **Activity 23**  *Inverse Functions: Exponential and Logarithmic Functions*  23-1 Learning Targets:   * Use composition to verify two functions as inverse. * Define the logarithm of y with base b. * Write the Inverse Properties for logarithms.   23-2 Learning Targets:   * Apply the properties of logarithms in any base. * Compare and expand logarithmic expressions. * Use the Change of Base Formula.   23-3 Learning Targets:   * Find intercepts and asymptotes of logarithmic functions. * Determine the domain and range of a logarithmic function. * Write and graph transformations of logarithmic functions. | ***Logarithms in Other Bases*** |
| [**Change of base formula**](http://www.khanacademy.org/math/algebra2/logarithms-tutorial/logarithm_properties/v/change-of-base-formulahttp://www.khanacademy.org/math/algebra2/logarithms-tutorial/logarithm_properties/v/change-of-base-formula)  [**Change of base formula proof**](http://www.khanacademy.org/math/algebra2/logarithms-tutorial/logarithm_properties/v/change-of-base-formula-proof) |
| ***Graphing Logarithmic Functions*** |
| [**Graphing logarithmic functions**](http://www.khanacademy.org/math/algebra2/logarithms-tutorial/logarithm_basics/v/graphing-logarithmic-functions)  [**Graphs of logarithmic functions**](http://www.khanacademy.org/math/algebra2/exponential_and_logarithmic_func/log_functions/v/logarithmic-function-graphs) |
| **Activity 24**  *Logarithmic and Exponential Equations and Inequalities*  24-1 Learning Targets:   * Write exponential equations to represent situations. * Solve exponential equations.   24-2 Learning Targets:   * Solve exponential equations using logarithms. * Estimate the solution to an exponential equation. * Apply the compounded interest formula.   24-3 Learning Targets:   * Solve logarithmic equations. * Identify extraneous solutions to logarithmic equations. * Use properties of logarithms to rewrite logarithmic expressions.   24-4 Learning Targets:   * Solve exponential inequalities. * Solve logarithmic inequalities. | ***Exponential Equations*** |
| [**Solving exponential equation**](http://www.khanacademy.org/math/algebra2/exponential_and_logarithmic_func/exponential-modeling/v/solve-exponentials)  [**Solving exponential equation with logarithm**](http://www.khanacademy.org/math/algebra2/logarithms-tutorial/logarithm_basics/v/exponential-equation) |
| ***Logarithmic Equations*** |
| [**Solving logarithmic equations**](http://www.khanacademy.org/math/algebra2/exponential_and_logarithmic_func/logarithmic-equations/v/solving-logarithmic-equations_dup_1)  [**Solving logarithmic equations**](http://www.khanacademy.org/math/algebra2/exponential_and_logarithmic_func/logarithmic-equations/v/solving-logarithmic-equations) |
| ***Application: Compound Interest*** |
| [**Introduction to compound interest and e**](http://www.khanacademy.org/math/algebra2/exponential_and_logarithmic_func/continuous_compounding/v/introduction-to-compound-interest-and-e)  [**Compound interest and e (part 2)**](http://www.khanacademy.org/math/algebra2/exponential_and_logarithmic_func/continuous_compounding/v/compound-interest-and-e-part-2)  [**Compound interest and e (part 3)**](http://www.khanacademy.org/math/algebra2/exponential_and_logarithmic_func/continuous_compounding/v/compound-interest-and-e-part-3)  [**Compound interest and e (part 4)**](http://www.khanacademy.org/math/algebra2/exponential_and_logarithmic_func/continuous_compounding/v/compound-interest-and-e-part-4) |
| **Unit 5: Radical and Rational Functions** | |
| **Activity 25**  *Square Root and Cube Root Functions*   * 1. Learning Targets: * Graph and describe transformations of the square root function y=√x. * Interpret key features of a graph that models a relationship between two quantities.   25-2 Learning Targets:   * Solve square root equations. * Identify extraneous solutions.   1. Learning Targets: * Graph transformations of the cube root function y=3√x*.* . * Identify key features of a graph that models a relationship between two quantities.   1. Learning Targets: * Solve cube root equations. * Check the reasonableness of solutions. | ***Graphing Radical Functions*** |
| [**Flipping and shifting radical functions**](http://www.khanacademy.org/math/algebra2/functions_and_graphs/shifting-reflecting-functions/v/flipping-shifting-radical-functions)  [**Matching radical functions with graphs exercise example**](http://www.khanacademy.org/math/algebra2/functions_and_graphs/shifting-reflecting-functions/v/radical-function-graphs-exercise) |
| ***Solving Radical Equations*** |
| [**Equations for radical functions example**](http://www.khanacademy.org/math/algebra2/functions_and_graphs/shifting-reflecting-functions/v/radical-functions-equations)  [**Solving radical equations**](http://www.khanacademy.org/math/algebra/exponent-equations/radical_equations/v/solving-radical-equations)  [**Solving radical equations 1**](http://www.khanacademy.org/math/algebra/exponent-equations/radical_equations/v/solving-radical-equations-1)  [**Solving radical equations 2**](http://www.khanacademy.org/math/algebra/exponent-equations/radical_equations/v/solving-radical-equations-2)  [**Solving radical equations 3**](http://www.khanacademy.org/math/algebra/exponent-equations/radical_equations/v/solving-radical-equations-3)  [**Extraneous solutions to radical equations**](http://www.khanacademy.org/math/algebra/exponent-equations/radical_equations/v/extraneous-solutions-to-radical-equations) |
| ***Applying Radical Equations*** |
| [**Applying radical equations 1**](http://www.khanacademy.org/math/algebra/exponent-equations/radical_equations/v/applying-radical-equations-1)  [**Applying radical equations 2**](http://www.khanacademy.org/math/algebra/exponent-equations/radical_equations/v/applying-radical-equations-2)  [**Applying radical equations 3**](http://www.khanacademy.org/math/algebra/exponent-equations/radical_equations/v/applying-radical-equations-3) |
| **Activity 26**  *Inverses: Roots, Squares, and Cubes*  26-1 Learning Targets:   * Graph and write the inverse of square root functions. * Find a square root model for a given table of data.   26-2 Learning Targets:   * Graph and write the inverse of square root functions. * Find the inverse relations of quadratic functions.   26-3 Learning Targets:   * Graph and write the inverse of cube root functions. * Find the inverse relations of cubic functions. | ***Inverse Functions*** |
| [**Introduction to function inverses**](http://www.khanacademy.org/math/algebra2/functions_and_graphs/function_inverses_2/v/introduction-to-function-inverses)  [**Function inverses example 2**](http://www.khanacademy.org/math/algebra2/functions_and_graphs/function_inverses_2/v/function-inverses-example-2)  [**Function inverses example 3**](http://www.khanacademy.org/math/algebra2/functions_and_graphs/function_inverses_2/v/function-inverses-example-3) |
| **Activity 27**  *Introduction to Rational Functions*  27-1 Learning Targets:   * Formulate rational equations that model real-world situations. * Graph equations on coordinate axes.   27-2 Learning Targets:   * Formulate rational equations that model real-world situations. * Graph equations on coordinate axes.   27-3 Learning Targets:   * Determine the horizontal and vertical asymptotes of a rational function. * Graph a rational function on the coordinate plane. | ***Graphs of Rational Functions*** |
| [**Matching rational functions to their graphs**](http://www.khanacademy.org/math/algebra2/rational-expressions/rational-function-graphing/v/example-rational-functions-graphs)  [**Another rational function graph example**](http://www.khanacademy.org/math/algebra2/rational-expressions/rational-function-graphing/v/another-rational-function-graph-example)  [**A third example of graphing a rational function**](http://www.khanacademy.org/math/algebra2/rational-expressions/rational-function-graphing/v/a-third-example-of-graphing-a-rational-function) |
| ***Asymptotes of Rational Functions*** |
| [**Asymptotes of rational functions**](http://www.khanacademy.org/math/algebra2/rational-expressions/rational-function-graphing/v/asymptotes-of-rational-functions)  [**Horizontal and vertical asymptotes of function**](http://www.khanacademy.org/math/algebra2/rational-expressions/rational-function-graphing/v/horizontal-vertical-asymptotes) |
| **Activity 28**  *Inverse Variation and Rational Functions*  28-1 Learning Targets:   * Create, solve, and graph an equation involving inverse variation. * Solve an equation involving combined variation.   28-2 Learning Targets:   * Describe transformations of the parent function f(x)=1/*x* and sketch the graphs. * Identify the x-intercepts, y-intercepts, and asymptotes of transformations of the parent function f(x)=1/x. | ***Direct and Inverse Variation*** |
| [**Direct and inverse variation**](http://www.khanacademy.org/math/algebra-basics/core-algebra-linear-equations-inequalities/core-algebra-direct_inverse_variation/v/direct-and-inverse-variation)  [**Recognizing direct and inverse variation**](http://www.khanacademy.org/math/algebra-basics/core-algebra-linear-equations-inequalities/core-algebra-direct_inverse_variation/v/recognizing-direct-and-inverse-variation) |
| **Activity 29**  *Simplifying Rational Expressions*  29-1 Learning Targets:   * Simplify rational expressions. * Multiply and divide rational expressions.   29-2 Learning Targets:   * Add and subtract rational expressions. * Simplify complex fractions.   29-3 Learning Targets:   * Identify the vertical asymptotes of rational functions by finding the domain values that make the functions undefined. * Use the degrees of the numerator and denominator of rational functions to identify the horizontal asymptotes.   29-4 Learning Targets:   * Analyze and graph rational functions, identifying any asymptotes, intercepts, and holes. * Analyze and graph rational functions representing real-world scenarios. | ***Multiplying and Dividing Rational Expressions*** |
| [**Simplifying rational expressions introduction**](http://www.khanacademy.org/math/algebra2/rational-expressions/simplifying-rational-alg/v/simplifying-rational-expressions-introduction)  [**Simplifying rational expressions 1**](http://www.khanacademy.org/math/algebra2/rational-expressions/simplifying-rational-alg/v/simplifying-rational-expressions-1)  [**Simplifying rational expressions 2**](http://www.khanacademy.org/math/algebra2/rational-expressions/simplifying-rational-alg/v/simplifying-rational-expressions-2)  [**Simplifying rational expressions 2**](http://www.khanacademy.org/math/algebra2/rational-expressions/simplifying-rational-alg/v/simplifying-rational-expressions-example-2)  [**Simplifying rational expressions 3**](http://www.khanacademy.org/math/algebra2/rational-expressions/simplifying-rational-alg/v/simplifying-rational-expressions-3) |
| [**Multiplying and simplifying rational expressions**](http://www.khanacademy.org/math/algebra2/rational-expressions/multi-div-rational-exp/v/multiplying-and-simplifying-rational-expressions)  [**Multiplying and dividing rational expressions 1**](http://www.khanacademy.org/math/algebra2/rational-expressions/multi-div-rational-exp/v/multiplying-and-dividing-rational-expressions-1)  [**Multiplying and dividing rational expressions 2**](http://www.khanacademy.org/math/algebra2/rational-expressions/multi-div-rational-exp/v/multiplying-and-dividing-rational-expressions-2)  [**Multiplying and dividing rational expressions 3**](http://www.khanacademy.org/math/algebra2/rational-expressions/multi-div-rational-exp/v/multiplying-and-dividing-rational-expressions-3) |
| ***Adding and Subtracting Rational Expressions*** |
| [**Adding and subtracting rational expressions**](http://www.khanacademy.org/math/algebra2/rational-expressions/rational_expressions/v/adding-and-subtracting-rational-expressions)  [**Adding and subtracting rational expressions 2**](http://www.khanacademy.org/math/algebra2/rational-expressions/rational_expressions/v/adding-and-subtracting-rational-expressions-2)  [**Subtracting rational expressions**](http://www.khanacademy.org/math/algebra2/rational-expressions/rational_expressions/v/subtracting-rational-expressions)  [**Simplifying first for subtracting rational expressions**](http://www.khanacademy.org/math/algebra2/rational-expressions/rational_expressions/v/simplifying-first-for-subtracting-rational-expressions)  [**Rationalizing denominators of expressions**](http://www.khanacademy.org/math/algebra2/rational-expressions/rational_expressions/v/rationalizing-denominators-of-expressions) |
| ***Finding Horizontal and Vertical Asymptotes*** |
| [**Asymptotes of rational functions**](http://www.khanacademy.org/math/algebra2/rational-expressions/rational-function-graphing/v/asymptotes-of-rational-functions)  [**Horizontal and vertical asymptotes of function**](http://www.khanacademy.org/math/algebra2/rational-expressions/rational-function-graphing/v/horizontal-vertical-asymptotes) |
| ***Graphing Rational Functions*** |
| [**Matching rational functions to their graphs**](http://www.khanacademy.org/math/algebra2/rational-expressions/rational-function-graphing/v/example-rational-functions-graphs)  [**Another rational function graph example**](http://www.khanacademy.org/math/algebra2/rational-expressions/rational-function-graphing/v/another-rational-function-graph-example)  [**A third example of graphing a rational function**](http://www.khanacademy.org/math/algebra2/rational-expressions/rational-function-graphing/v/a-third-example-of-graphing-a-rational-function) |
| **Activity 30**  *Rational Equations and Inequalities*  30-1 Learning Targets:   * Solve rational equations, identifying any extraneous solutions. * Create and solve rational equations that represent work problems.   30-2 Learning Targets:   * Solve rational inequalities by graphing. * Solve rational inequalities by finding the sign of the inequality on either side of the numerator and denominator zeros. | ***Solving Rational Equations*** |
| [**Ex 1: Multi step equation**](http://www.khanacademy.org/math/algebra2/rational-expressions/solving-rational-equations/v/ex-1-multi-step-equation)  [**Rational equations**](http://www.khanacademy.org/math/algebra2/rational-expressions/solving-rational-equations/v/rational-equations)  [**Solving rational equations 1**](http://www.khanacademy.org/math/algebra2/rational-expressions/solving-rational-equations/v/solving-rational-equations-1)  [**Solving rational equations 2**](http://www.khanacademy.org/math/algebra2/rational-expressions/solving-rational-equations/v/solving-rational-equations-2)  [**Solving rational equations 3**](http://www.khanacademy.org/math/algebra2/rational-expressions/solving-rational-equations/v/solving-rational-equations-3)  [**Applying rational equations 1**](http://www.khanacademy.org/math/algebra2/rational-expressions/solving-rational-equations/v/applying-rational-equations-1)  [**Applying rational equations 2**](http://www.khanacademy.org/math/algebra2/rational-expressions/solving-rational-equations/v/applying-rational-equations-2)  [**Applying rational equations 3**](http://www.khanacademy.org/math/algebra2/rational-expressions/solving-rational-equations/v/applying-rational-equations-3)  [**Extraneous solutions to rational equations**](http://www.khanacademy.org/math/algebra2/rational-expressions/solving-rational-equations/v/extraneous-solutions-to-rational-equations) |
| ***Solving Rational Inequalities*** |
| [**Rational inequalities**](http://www.khanacademy.org/math/algebra2/rational-expressions/solving-rational-equations/v/rational-inequalities)  [**Rational inequalities 2**](http://www.khanacademy.org/math/algebra2/rational-expressions/solving-rational-equations/v/rational-inequalities-2) |
| **Unit 6: Trigonometry** | |
| **Activity 31**  *Understanding Radian Measure*  31-1 Learning Targets:   * Develop formulas for the length of an arc. * Describe radian measure.   31-2 Learning Targets:   * Develop and apply formulas for the length of an arc. * Apply radian measure. | ***Radian Measure*** |
| [**Introduction to radians**](http://www.khanacademy.org/math/trigonometry/unit-circle-trig-func/radians_tutorial/v/introduction-to-radians)  [**Introduction to the unit circle**](http://www.khanacademy.org/math/trigonometry/unit-circle-trig-func/Trig-unit-circle/v/unit-circle-definition-of-trig-functions-1)  [**Rotation by radians and quadrants**](http://www.khanacademy.org/math/trigonometry/unit-circle-trig-func/radians_tutorial/v/rotation-by-radians-and-quadrants) |
| ***Arc Length*** |
| [**Arc length as a fraction of circumference**](http://www.khanacademy.org/math/trigonometry/unit-circle-trig-func/radians_tutorial/v/arc-length-as-fraction-of-circumference)  [**Finding arc length from radian angle measure**](http://www.khanacademy.org/math/trigonometry/unit-circle-trig-func/radians_tutorial/v/arc-length-from-angle-measure) |
| ***Radian and Degree Measure*** |
| [**Example: Radian measure and arc length**](http://www.khanacademy.org/math/trigonometry/unit-circle-trig-func/radians_tutorial/v/radian-measure-and-arc-length)  [**Radians and degrees**](http://www.khanacademy.org/math/trigonometry/unit-circle-trig-func/radians_tutorial/v/radians-and-degrees)  [**Example: Converting degrees to radians**](http://www.khanacademy.org/math/trigonometry/unit-circle-trig-func/radians_tutorial/v/we-converting-degrees-to-radians)  [**Example: Converting radians to degrees**](http://www.khanacademy.org/math/trigonometry/unit-circle-trig-func/radians_tutorial/v/we-converting-radians-to-degrees)  [**Radian and degree conversion practice**](http://www.khanacademy.org/math/trigonometry/unit-circle-trig-func/radians_tutorial/v/radian-and-degree-conversion-practice) |
| **Activity 32**  *Trigonometric Functions*  32-1 Learning Targets:   * Explore angles drawn in standard position on the coordinate plane. * Find the sine of θ and the cosine of θ.   32-2 Learning Targets:   * Find the sine of θ and the cosine of θ using special right triangles. * Find the tan of θ. | ***The Unit Circle*** |
| [**Introduction to the unit circle**](http://www.khanacademy.org/math/trigonometry/unit-circle-trig-func/Trig-unit-circle/v/unit-circle-definition-of-trig-functions-1)  [**Solving triangle in unit circle**](http://www.khanacademy.org/math/trigonometry/unit-circle-trig-func/trig-functions-special-angles/v/solving-triangle-unit-circle) |
| ***Trigonometric Ratios*** |
| [**Matching ratios to trig functions**](http://www.khanacademy.org/math/trigonometry/unit-circle-trig-func/Trig-unit-circle/v/matching-ratios-trig-functions) |
| **Activity 33**  *Trigonometric Identities: Pythagorean Connection*  33-1 Learning Targets:   * Prove the Pythagorean identity. * Use the Pythagorean identity to find sin θ, cos θ, or tan θ, given the value of one of these functions and the quadrant of θ.   33-2 Learning Targets:   * Define the three reciprocal trigonometric functions. * Use the Pythagorean identity and the reciprocal trigonometric functions to prove other trigonometric identities. | ***Pythagorean Identities*** |
| [**Pythagorean trig identity from soh cah toa**](http://www.khanacademy.org/math/trigonometry/less-basic-trigonometry/pythagorean-identity/v/pythagorean-trig-identity-from-soh-cah-toa)  [**Pythagorean trig identity from unit circle**](http://www.khanacademy.org/math/trigonometry/less-basic-trigonometry/pythagorean-identity/v/pythagorean-trig-identity-from-unit-circle)  [**Using the Pythagorean trig identity**](http://www.khanacademy.org/math/trigonometry/less-basic-trigonometry/pythagorean-identity/v/using-the-pythagorean-trig-identity)  [**Examples using pythagorean identities to simplify trigonometric expressions**](http://www.khanacademy.org/math/trigonometry/less-basic-trigonometry/pythagorean-identity/v/examples-using-pythagorean-identities-to-simplify-trigonometric-expressions) |
| ***Reciprocal Functions*** |
| [**Secant (sec), cosecant (csc) and cotangent (cot) example**](http://www.khanacademy.org/math/trigonometry/basic-trigonometry/reciprocal-trig-functions/v/example-the-six-trig-ratios)  [**Example: Using trig to solve for missing information**](http://www.khanacademy.org/math/trigonometry/basic-trigonometry/reciprocal-trig-functions/v/example-using-trig-to-solve-for-missing-information) |
| **Activity 34**  *Graphs of Trigonometric Functions*  34-1 Learning Targets:   * Identify periodic functions. * Find the period, midline, and amplitude of periodic functions.   34-2 Learning Targets:   * Graph the sine function, y = a sin b x. * Find the period, midline, and amplitude of sine functions.   34-3 Learning Targets:   * Graph the cosine function, y = a cos bx. * Find the period, midline, and amplitude of cosine functions.   34-4 Learning Targets:   * Graph the tangent function, y = a tan b x. * Find the period, and midline of tangent functions.   34-5 Learning Targets:   * Describe and graph functions of the form y = a sin b(x − h) + k, y = a cos b(x − h) + k, and y = a tan b(x − h) + k. * Find the period, amplitude, and midline of these trigonometric functions. | ***Periodic Functions*** |
| [**Midline, amplitude and period of a function**](http://www.khanacademy.org/math/trigonometry/trig-function-graphs/trig_graphs_tutorial/v/midline-amplitude-period)  [**Example: Amplitude and period**](http://www.khanacademy.org/math/trigonometry/trig-function-graphs/trig_graphs_tutorial/v/we-amplitude-and-period)  [**Plotting maxima, minima and midline intersections of trig function**](http://www.khanacademy.org/math/trigonometry/trig-function-graphs/trig_graphs_tutorial/v/plotting-trig-features) |
| ***Sine Function*** |
| [**Example: Graph, domain, and range of sine function**](http://www.khanacademy.org/math/trigonometry/trig-function-graphs/trig_graphs_tutorial/v/we-graph-domain-and-range-of-sine-function) |
| ***Cosine Function*** |
| [**Example: Graph of cosine**](http://www.khanacademy.org/math/trigonometry/trig-function-graphs/trig_graphs_tutorial/v/we-graph-of-cosine-function)  [**Example: Intersection of sine and cosine**](http://www.khanacademy.org/math/trigonometry/trig-function-graphs/trig_graphs_tutorial/v/we-graphs-of-sine-and-cosine-functions) |
| ***Transformations*** |
| [**Example: Amplitude and period transformations**](http://www.khanacademy.org/math/trigonometry/trig-function-graphs/trig_graphs_tutorial/v/example-amplitude-and-period-transformations)  [**Example: Amplitude and period cosine transformations**](http://www.khanacademy.org/math/trigonometry/trig-function-graphs/trig_graphs_tutorial/v/amplitude-and-period-cosine-transformations) |
| ***Tangent Function*** |
| [**Tangent graph**](http://www.khanacademy.org/math/trigonometry/trig-function-graphs/trig_graphs_tutorial/v/tangent-graph) |
| **Activity 35**  *Choosing Functions to Model Periodic Phenomena*  35-1 Learning Targets:   * Use trigonometric functions to model real-world periodic phenomena. * Identify key features of these functions. | ***Modeling Periodic Phenomena*** |
| [**Modeling annual temperature variation with trigonometry**](http://www.khanacademy.org/math/trigonometry/trig-function-graphs/modeling-periodic-functions/v/modeling-temperature-fluxtuations)  [**Applying inverse trig function with model**](http://www.khanacademy.org/math/trigonometry/trig-function-graphs/modeling-periodic-functions/v/inverse-trig-with-model)  [**Modeling temperature through the day**](http://www.khanacademy.org/math/trigonometry/trig-function-graphs/modeling-periodic-functions/v/modeling-with-shifted-trig-functions)  [**Day length in Alaska**](http://www.khanacademy.org/math/trigonometry/trig-function-graphs/modeling-periodic-functions/v/modeling-periodic-function-with-shift)  [**Example: Figure out the trig function**](http://www.khanacademy.org/math/trigonometry/trig-function-graphs/trig_graphs_tutorial/v/matching-a-trigonometric-function-to-its-graph)  [**Determining the equation of a trig function**](http://www.khanacademy.org/math/trigonometry/trig-function-graphs/trig_graphs_tutorial/v/trig-function-equation) |
| **Unit 7: Probability and Statistics** | |
| **Activity 36**  *Normal Distribution*  36-1 Learning Targets:   * Represent distribution with appropriate data plots. * Interpret shape of a distribution and relate shape to measures of center and spread.   36-2 Learning Targets:   * Recognize characteristics of a normal distribution. * Use mean and standard deviation to completely describe a normal distribution.   36-3 Learning Targets:   * Estimate probabilities associated with z-scores using normal curve sketches. * Determine probabilities for z-scores using a standard normal table.   36-4 Learning Targets:   * Determine probabilities for z-scores using technology. * Use a normal distribution, when appropriate, as a model for a population from which a sample of numeric data has been drawn. | ***Distribution*** |
| [**Comparing means of distributions**](http://www.khanacademy.org/math/probability/descriptive-statistics/central_tendency/v/comparing-distribution-means)  [**Means and medians of different distributions**](http://www.khanacademy.org/math/probability/descriptive-statistics/central_tendency/v/comparing-means-and-medians) |
| ***Normal Distribution*** |
| [**Introduction to the normal distribution**](http://www.khanacademy.org/math/probability/statistics-inferential/normal_distribution/v/introduction-to-the-normal-distribution)  [**normal distribution problems: Qualitative sense of normal distributions**](http://www.khanacademy.org/math/probability/statistics-inferential/normal_distribution/v/ck12-org-normal-distribution-problems-qualitative-sense-of-normal-distributions) |
| **Activity 37**  *Random Sampling*  37-1 Learning Targets:   * Explain why random sampling is advantageous when conducting a survey   37-2 Learning Targets:   * Explain why random allocation of treatments is critical to a good experiment.   37-3 Learning Targets:   * .Identify a confounding variable in an observational study. | ***Sampling*** |
| [**Introduction to random sampling**](http://www.khanacademy.org/math/recreational-math/math-warmup/random-sample-warmup/v/random-sample-warmup1)  [**Random sampling intuition**](http://www.khanacademy.org/math/recreational-math/math-warmup/random-sample-warmup/v/random-sample-warmup2)  [**Reasonable samples**](http://www.khanacademy.org/math/cc-seventh-grade-math/cc-7th-probability-statistics/cc-7th-population-sampling/v/reasonable-samples)  [**Inferring population mean from sample mean**](http://www.khanacademy.org/math/cc-seventh-grade-math/cc-7th-probability-statistics/cc-7th-population-sampling/v/statistics-sample-vs-population-mean) |
| **Activity 38**  *Simulations* | **N/A** |
| **Activity 39**  *Margin of Error*  39-1 Learning Targets:   * Use margin of error in an estimate of a population proportion. * Use simulation models for random samples.   39-2 Learning Targets:   * Use margin of error in an estimate of a population proportion. * Relate margin of error to the population proportion and to the sample size. | ***Error*** |
| [**Standard error of the mean**](http://www.khanacademy.org/math/probability/statistics-inferential/sampling_distribution/v/standard-error-of-the-mean)  [**Population standard deviation**](http://www.khanacademy.org/math/probability/descriptive-statistics/variance_std_deviation/v/population-standard-deviation)  [**Sample standard deviation and bias**](http://www.khanacademy.org/math/probability/descriptive-statistics/variance_std_deviation/v/sample-standard-deviation-and-bias)  [**Sampling distribution of the sample mean**](http://www.khanacademy.org/math/probability/statistics-inferential/sampling_distribution/v/sampling-distribution-of-the-sample-mean)  [**Sampling distribution of the sample mean 2**](http://www.khanacademy.org/math/probability/statistics-inferential/sampling_distribution/v/sampling-distribution-of-the-sample-mean-2)  [**Sampling distribution example problem**](http://www.khanacademy.org/math/probability/statistics-inferential/sampling_distribution/v/sampling-distribution-example-problem) |
| **Activity 40**  *Designing and Conducting Simulations* | **N/A** |