The Ascend Math® Solution

Algebra II Scope

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Contents

Solving Linear Equations

This objective covers the solution of linear equations, balancing equations, isolation of the unknown, and moving terms from one side of the equation to the other. Removal of parentheses and simplification of terms is covered as well as collecting like terms. Equations covered are at the Algebra II level of difficulty. Also covered are literal equations or equations involving several different symbols in which one in particular is to be isolated.

Modeling Applications with Linear Equations

This objective covers a variety of intermediate level word problems including problems involving distance, speed, and time as well as problems involving interest rates.

Solving Linear Inequalities

This objective covers solving linear inequalities by isolating the unknown using methods similar to those for linear equations. The reversal of inequality symbol when multiplying both sides of an inequality by a negative number is also covered. The problems covered here are at the Algebra II level of difficulty.

Solving Absolute Value Equations

This objective covers the solution of equations in which one or more terms contain the absolute value of a linear expression in the unknown. The method of isolation of the absolute value term is used.

Compound Inequalities

This objective covers the method of solving and graphing compound inequalities and pairs of inequalities in one unknown.

Solving Absolute Value Inequalities (Less Than)

This objective covers the method of solving absolute value inequalities by isolating the absolute value term and reducing to a system of "less than" inequalities.

Solving Absolute Value Inequalities (Greater Than)

This objective covers the method of solving absolute value inequalities by isolating the absolute value term and reducing to a system of "greater than" inequalities.

Exponents

This objective covers the laws of exponents in relation to the basic operations on real numbers as well as the use of the laws of exponents to simplify or rearrange algebraic expressions. Negative exponents are also covered.

Addition and Subtraction of Polynomials

This objective will cover addition and subtraction of polynomials. It will also cover the removal of parentheses.

Multiplication of Polynomials

This objective will cover multiplication of polynomials as well as removal of parentheses.

Greatest Common Factor and Factoring Monomials

This objective covers factoring of monomials by using the Greatest Common Factor method.

Factoring Trinomials

This objective covers the factoring of trinomials, by arranging terms in descending degree and inspection of signs to locate signs in the factors.

Factoring Trinomials by Grouping

This objective covers polynomials with four or more terms, the method of factoring by grouping is used.

Factoring Binomials

This objective covers factoring binomials in the case of the difference of two perfect squares and the sum or difference of two cubes. The binomials which reduce to these cases after factorization of the greatest common factor is applied.

General Factoring

This objective covers factoring polynomials in general. In the case of binomials the difference of two perfect squares and the sum or difference of two cubes as well as binomials which can be treated by these methods are covered. In the case of trinomials the method of arranging terms in order of decreasing degree in order to determine the signs of the terms in the factors is covered. For polynomials with more than three terms factoring by grouping is covered. Polynomials in more than one variable are also covered.

Solving Quadratic Equations by Factoring

This objective covers solving quadratic equations by factoring

Multiplication and Division of Rational Expressions

This objective covers multiplication and division of rational expressions as well as reducing to lowest terms by factoring both numerator and denominator. In case of multiplication the use of cancellation before multiplication to simplify work is covered. The problems covered are at the Algebra II level.

Addition and Subtraction of Rational Expressions (Common Denominators)

This objective will cover the addition and subtraction of rational expressions with common denominators.

Addition and Subtraction of Rational Expressions (Different Denominators)

This objective will cover the addition and subtraction of rational expressions by finding the least common denominator after factoring all denominators.

Complex Fractions

This objective covers complex fractions and the short method of simplification by multiplying numerator and denominator by the least common denominator of all denominators in the terms of the numerator and denominator of the complex fraction. This objective also covers complex fractions in which negative exponents appear.

Division of Rational Expressions

This objective covers the simplification of rational expressions.

Division of Rational Expressions (Synthetic Division)

This objective covers the simplification of rational expressions by using synthetic and long division of polynomials to divide the numerator by the denominator when the numerator has higher degree than the denominator.

Equations Involving Rational Expressions

This objective covers methods for solving equations involving rational expressions which can be reduced to either linear or quadratic equations on multiplication of both sides of the equation by the least common denominator of all denominators in the equation. The notion of elimination of extraneous roots or solutions by checking all solutions in the original equation is also covered. The problems covered are at the level of Algebra II.

Modeling Applications with Rational Expressions

This objective covers a variety of models that arise which lead to equations involving rational expressions. In particular, problems involving distance, rate and time, as well as word problems are covered. Also covered are problems with literal equations.

Rational Exponents

This objective covers the meaning and usage of rational exponents and the simplification of algebraic expressions using the laws of exponents when rational exponents are involved. The problems covered here are at the Algebra II level of difficulty.

Simplifying Radicals
This objective covers the simplification of algebraic expressions involving radicals.

Simplifying Radicals (Fractional Exponents)
This objective covers the equivalence of radicals with fractional exponents as well as rationalizing denominators where these radicals are encountered in denominators.

Addition and Subtraction of Radical Expressions
This objective covers the simplification of algebraic expressions with several terms involving radicals. The method of extraction of perfect roots from the various terms followed by collecting like terms is covered.

Multiplication of Radical Expressions
This objective covers multiplication of radical expressions and their simplification by extracting perfect roots. This objective also covers rationalizing radical expressions with binomial denominators by multiplying numerator and denominator by the appropriate conjugate of the denominator.

Division of Radical Expressions
This objective covers division of radical expressions and their simplification by extracting perfect roots. This objective also covers rationalizing radical expressions with binomial denominators by multiplying numerator and denominator by the appropriate conjugate of the denominator.

Radical Equations
This objective covers the solution of equations with terms containing radicals via successive isolation of radicals and their removal by raising both sides of the equation to the appropriate power. The removal of extraneous solutions from the solution set by checking all solutions in the original equation is also covered.

Quadratic Equations Solved by Factoring
This objective covers a variety of equations, involving various previously studied algebraic expressions, which are reducible to quadratic equations which can then be solved by factoring. This objective also covers the method of solving equations by substituting new symbols for expressions which appear repeatedly in the same equation.

Solving Quadratic Equations by the Completing the Square
This objective covers the solution of quadratic equations in which the unknowns can be collected into a single term which is the square of a binomial and then are solvable directly by roots. The technique of completing the square is covered to show that the preceding form can always be obtained.

Solving Quadratic Equations by using the Square Root Property

This objective covers the solution of quadratic equations in which the unknowns can be collected into a single term which is the square of a binomial and then are solvable directly by roots. The technique of completing the square is covered to show that the preceding form can always be obtained.

Solving Quadratic Equations by the Quadratic Formula

This objective covers the quadratic formula and its use in solving quadratic equations. This objective also covers the rearrangement of any quadratic into standard form to facilitate identification of appropriate coefficients as to their proper place in the quadratic formula for computation of solutions.

Modeling Applications with Quadratic Equations

This objective covers various applications which lead to equations which after rearrangement and simplification become reduced to quadratic equations. This objective also covers the Pythagorean Theorem and applications to perimeter and area problems.

Distance and Slope

This objective covers the calculation of the distance between pairs of points with given coordinates as well as the slope of the line objective connecting them.

Intercepts

This objective covers the rectangular coordinate system and intercept for linear equations in two unknowns.

Equations of Straight Lines: Finding Slope of a Line

This objective covers the slope-intercept and point-slope form for the equation of a line. The relationship of a slope to steepness and methods of calculating slope via rise over run.

Equations of Straight Lines: Using the Slope-Intercept Form

This objective covers the slope-intercept and point-slope form for the equation of a line. This objective will show how to rearrange the points into slope-intercept form.

Equations of Straight Lines: Finding Perpendicular and Parallel Lines

This objective covers the slope-intercept and point-slope form for the equation of a line. This objective also covers how to find an equation that is perpendicular to another line.

Domain and Range of a Relation

This objective covers graphing of linear inequalities by the technique of graphing the boundary lines and using test points off of the boundary lines to decide which regions to shade or include. This objective also covers finding the domain and range.

Function, a Type of Relation

This objective covers graphing of linear inequalities by the technique of graphing the boundary lines and using test points off of the boundary lines. This objective also covers how to determine if a line is a function or not.

Graphing Linear Inequalities in Two Variables

This objective covers graphing of linear inequalities by the technique of graphing the boundary lines and using test points off of the boundary lines to decide which regions to shade or include.

Graphing the Intersection of Two Linear Inequalities

This objective covers graphing the intersection of two linear inequalities by the technique of graphing the boundary lines and using test points off of the boundary lines to decide which regions to shade or include.

Simultaneous Equations: Using Addition Method

This objective covers the solution of systems of linear equations using the addition method.

Simultaneous Equations: Using Substitution Method

This objective covers the solution of systems of linear equations using the substitution method.

Simultaneous Equations: Using Elimination Method

This objective covers the solution of systems of linear equations using the elimination method.

Topics covered by Ascend Math Algebra II include:

- exponents,
- solving linear equations and inequalities
- solving applications
- modeling with functions
- polynomials
- factoring
- rational expressions
- complex fractions
- graphing linear equations and inequalities
- radicals
- rational exponents
- solving quadratic equations

About Ascend Math®

Ascend Math is a research based instructional resource in which students have proven to achieve two or more grade level gains in a six month period. This web delivered individualized intervention resource identifies skill gaps, prescribes targeted instruction, and motivates students to achieve their maximum performance and potential.

Ascend Math offers intensive math * intervention instructional resources, addresses multiple learning modalities by delivering video instruction, student-centered concept explorations, interactive practice with immediate feedback and opportunities for re-teaching, and printable resources.

Ascend's fully automated solution reduces the demands on teachers' time. Ascend's approach supports improved math achievement regardless of students' reading levels. This resource provides important support for ESE, ESOL and students with special needs through the use of video, audio, and multimedia components. Ascend's reports will assist in simplifying progress monitoring and helping meet Federal audit guidelines.

K-Algebra II study plans align, by grade level, to National Council of Teachers of Mathematics (NCTM) standards, Core Curriculum and state standards. Instruction is delivered in a logical math sequence and students can progress at their own pace and track their own progress and success. Ascend Math is currently used by hundreds of schools and districts serving tens of thousands of students throughout the U.S. and Canada.

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