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Elementary Algebra

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OpenStax	Lynn Marecek, Santa Ana College MaryAnne Anthony-Smith, Formerly of Santa Ana College	Elementary Algebra	Elementary Algebra: OpenStax
Mathispower4u Videos	James Sousa	MathIsPower4U	Mathispower4u Videos

Alta Elementary Algebra was developed to meet the scope and sequence of a typical one-semester algebra course. To develop the course, Knewton used three main sources of content: OpenStax, videos created by a Math Professor we have partnered with, and a team of Subject Matter Experts. The SMEs come from diverse backgrounds and are all academics in the field of mathematics.

Alta Elementary Algebra has two instructional sequences for every learning objective, giving students multiple opportunities to learn new concepts. Between our OpenStax text, video content, and Knewton SMEs, we were able to solicit ideas from math instructors and students at all levels of higher education. Alta Elementary Algebra covers the typical breadth of algebra topics, and also provides the necessary depth to ensure the course is manageable and engaging for instructors and students alike.

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1.5 Visualize Fractions

- Simplifying Fractions
  - Identify when fractions are equivalent
  - Simplify a fraction
- Multiplying and Dividing Fractions
  - Multiply fractions
  - Divide fractions
  - Simplify complex fractions
- Understanding Expressions with Fractions
  - Simplify expressions written with a fraction bar
  - Translate an English phrase to an expression with fractions

1.6 Add and Subtract Fractions

- Adding and Subtracting Fractions
  - Add or subtract fractions with a common denominator
  - Add or subtract fractions with different denominators
- Algebraic Expressions with Fractions
  - Use the order of operations to simplify complex fractions and expressions with multiple operations
  - Evaluate variable expressions with fractions

1.7 Decimals

- Understanding and Rounding Decimals
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  - Round decimals
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  - Divide decimals
- Decimals, Fractions, and Percents
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1.8 Square Roots and the Real Number System

- Square Roots and the Real Number System
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  - Identify real numbers
- Fractions and Decimals on the Number Line
  - Locate fractions on a number line and write inequality statements involving fractions (*11)
  - Locate decimals on a number line and write inequality statements involving decimals (*11)

1.9 Properties of Real Numbers

- Properties of the Real Number System
  - Use the commutative and associative properties
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        - Understand the multiplication and division properties of zero
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    - The Distributive Property
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    - Make unit conversions in the US system
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    - Make unit conversions in the metric system
    - Use mixed units of measurement in the metric system
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Chapter 2: Solving Linear Equations and Inequalities

2.1 Solve Equations Using the Subtraction and Addition Properties of Equality

- Solve Equations with the Subtraction and Addition Properties of Equality
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- Application Problems and the Subtraction and Addition Properties of Equality
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    - Use the subtraction and addition properties of equality to solve application problems

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- Solve Equations with the Division and Multiplication Properties of Equality
    - Solve an equation using the division and multiplication properties of equality
    - Solve an equation involving fractions or decimals using the division and multiplication properties of equality
    - Solve an equation that requires simplification using the division and multiplication properties of equality
- Application Problems and the Division and Multiplication Properties of Equality
    - Translate an English sentence to an algebraic equation and solve using the division and multiplication properties of equality
    - Use the division and multiplication properties of equality to solve application problems

2.3 Solve Equations with Variables and Constants on Both Sides
- Solving Linear Equations
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    - Express an inequality using interval notation
- Solving One-Step Linear Inequalities
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3.5 Solve Uniform Motion Applications
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- Graphing Linear Equations
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    - Graph vertical and horizontal lines (*24)

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- Understanding Slope
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    - Find the slope of horizontal and vertical lines
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4.5 Use the Slope-Intercept Form of an Equation of a Line
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4.7 Graphs of Linear Inequalities
- Graphing Linear Inequalities
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    - Recognize the relationship between the solutions of an inequality and its graph
    - Graph a linear inequality (*22)

Chapter 5: Systems of Linear Equations

5.1 Solve Systems of Equations by Graphing
- Solving Systems of Linear Equations by Graphing
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    - Solve a system of linear equations by graphing (*13)

- Determine the number of solutions of a linear system
- Solve applications of systems of linear equations by graphing

5.2 Solve Systems of Equations by Substitution

- Solving Systems of Linear Equations by Substitution
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  - Solve applications of systems of linear equations by substitution

5.3 Solve Systems of Equations by Elimination

- Solving Systems of Linear Equations by Elimination
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  - Solve a word problem using a system of equations
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  - Solve interest applications using a system of equations

5.6 Graphing Systems of Linear Inequalities

- Solving Systems of Linear Inequalities
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  - Solve applications of systems of linear inequalities

Chapter 6: Polynomials

6.1 Add and Subtract Polynomials

- Adding and Subtracting Polynomials
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  - Add and subtract monomials
  - Add and subtract polynomials
  - Evaluate a polynomial for a given value

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- Product Properties of Exponents
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  - Simplify expressions using the product property for exponents
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- Multiplying Polynomials
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    - Divide monomials

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    - Convert from scientific notation to decimal notation
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7.1 Greatest Common Factor and Factor by Grouping
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    - Factor a polynomial by grouping

7.2 Factor Quadratic Trinomials with Leading Coefficient 1
- Factoring Trinomials with a Leading Coefficient of 1
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    - Factor a trinomial of the form x^2+bxy+cy^2

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- Factoring Special Products
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7.5 General Strategy for Factoring Polynomials
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- Adding and Subtracting Square Root Expressions
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9.4 Multiply Square Roots
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    - Simplify expressions with higher roots
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10.2 Solve Quadratic Equations by Completing the Square
- Solving Quadratic Equations by Completing the Square
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10.3 Solve Quadratic Equations Using the Quadratic Formula
- Solving Quadratic Equations with the Quadratic Formula
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    - Solve a quadratic equation using the quadratic formula with 1 or 0 real solutions
    - Use the discriminant to predict the number of solutions of a quadratic equation

10.4 Solve Applications Modeled by Quadratic Equations

- Problem Solving with Quadratic Equations
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    - Solve geometric applications that may require the quadratic formula

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- Parabolas and Their Properties
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    - Find the axis of symmetry and vertex of a parabola
    - Find the intercepts of a parabola
- Graphing Quadratic Equations
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    - Find the maximum or minimum of a quadratic equation and use it in applications