



College Algebra with Corequisite Support: A Compressed Approach

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Alta College Algebra with Corequisite Support: A Compressed Approach is a 1 semester course that employs an early review/scaffolding period in the first several weeks of the course to prepare enrolled students for the college-level College Algebra work ahead. In this courses, students will spend the first 3-5 weeks working on developmental-level or preparatory content before moving on to college-level work for the balance of the semester.

To develop the course, Knewton used four main sources of content: Openstax, videos created by a Math Professor we have partnered with, the Open Textbook Library, and a team of Subject Matter Experts (SMEs). The SMEs come from diverse backgrounds and are all accomplished academics in the field of Mathematics.

Alta College Algebra with Corequisite Support: A Compressed Approach has two instructional sequences for every learning objective, giving students multiple opportunities to learn new concepts. Alta College Algebra with Corequisite Support: A Compressed Approach covers the typical breadth of college 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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 - Find the determinant of a 3x3 matrix
- Inverse and Identity Matrices
 - Understand the identity matrix and how it relates to the inverse matrix
 - Determine if a matrix is invertible using the determinant
 - Find the inverse of a 2x2 matrix
 - Find the inverse of a 3x3 matrix
- Solving Systems with Inverses
 - Solve a system of linear equations using the inverse of a 2x2 matrix
 - Solve a system of linear equations using the inverse of a 3x3 matrix

13.8 Cramer's Rule

- Solving Systems with Cramer's Rule
 - Use Cramer's rule to solve a system of two equations in two variables
 - Use Cramer's rule to solve a system of three equations in three variables
 - Use Cramer's rule to solve inconsistent or dependent systems

Chapter 14: Conic Sections

14.1 Ellipses

- Ellipses Centered at the Origin
 - Identify key points and axes of ellipses from a graph
 - Identify key points and axes of ellipses from an equation
 - Write the equation in standard form of an ellipse centered at the origin
 - Graph an ellipse centered at the origin from an equation in standard form
 - Ellipses Not Centered at the Origin
 - Identify key points and axes of ellipses not centered at the origin
 - Write the equation in standard form of an ellipse not centered at the origin
 - Graph an ellipse not centered at the origin
 - Ellipses Not in Standard Form and Applications of Ellipses
 - Convert an equation of an ellipse into standard form
 - Graph an ellipse where the equation is not given in standard form
 - Use ellipses in applications
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14.2 Hyperbolas

- Hyperbolas Centered at the Origin
 - Locate the vertices and foci of a hyperbola from a graph
 - Identify vertices, foci, and asymptotes of a hyperbola from an equation
 - Write the equation of a hyperbola centered at the origin in standard form
 - Graph a hyperbola centered at the origin from an equation in standard form
- Hyperbolas Not Centered at the Origin
 - Identify vertices, foci, and asymptotes of a hyperbola not centered at the origin
 - Write the equation of a hyperbola not centered at the origin
 - Graph a hyperbola not centered at the origin from an equation in standard form
- Hyperbolas Not in Standard Form and Applications of Hyperbolas
 - Convert an equation of a hyperbola into standard form
 - Graph a hyperbola from an equation given in general form
 - Use hyperbolas in applications

14.3 Parabolas

- Parabolas Centered at the Origin
 - Identify key components of a parabola from a graph
 - Identify key components of a parabola from an equation
 - Graph a parabola centered at the origin
 - Write the equation of a parabola centered at the origin in standard form
- Parabolas Not Centered at the Origin
 - Identify key components of a parabola not centered at the origin
 - Graph a parabola not centered at the origin
 - Write the equation of a parabola not centered at the origin in standard form
- Parabolas Not in Standard Form and Applications of Parabolas
 - Convert an equation of a parabola into standard form
 - Graph a parabola from an equation given in general form
 - Use parabolas in applications

Chapter 15: Sequences, Series, and Basic Probability

15.1 Sequences

- Introduction to Sequences
 - Write the terms of a sequence defined by an explicit formula
 - Write the terms of a sequence defined by a piecewise explicit formula
- Recursive Sequences
 - Write the terms of a sequence defined by a recursive formula
 - Write the terms of a sequence defined by a recursive formula with more than one initial term

15.2 Arithmetic Sequences

- Arithmetic Sequences
 - Find the common difference of an arithmetic sequence
 - Write terms of an arithmetic sequence
 - Write a recursive formula for an arithmetic sequence
 - Write an explicit formula for an arithmetic sequence
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- Applications of Arithmetic Sequences
 - Find specific terms of an arithmetic sequence given other terms
 - Solve application problems with arithmetic sequences

15.3 Geometric Sequences

- Geometric Sequences
 - Find the common ratio of a geometric sequence
 - Write terms of a geometric sequence
 - Write a recursive formula for a geometric sequence
 - Write an explicit formula for a geometric sequence
- Applications of Geometric Sequences
 - Write an explicit formula for the n th term of a sequence
 - Solve application problems with geometric sequences
 - Solve geometric sequence problems

15.4 Series

- Summation Notation and Arithmetic Series
 - Evaluate expressions using summation notation
 - Find the sum of a finite arithmetic series
- Finite and Infinite Geometric Series
 - Find the sum of a finite geometric series
 - Determine if the sum of an infinite series is defined
 - Find the sum of an infinite geometric series
- Applications of Series
 - Solve application problems with arithmetic series
 - Solve application problems with geometric series
 - Find the equivalent fraction for a repeating decimal
 - Solve an annuity problem

15.5 Counting Theory

- The Addition and Multiplication Principles
 - Solve counting problems using the addition principle
 - Solve counting problems using the multiplication principle
 - Evaluate an expression with factorials
- Permutations
 - Find the number of permutations of n distinct objects using the multiplication principle
 - Find the number of permutations of n distinct objects using a formula
 - Find the number of permutations of n non-distinct objects
- Combinations
 - Find the number of combinations using the formula
 - Find the number of subsets of a set

15.6 Binomial Theorem

- Binomial Expansion
 - Find a binomial coefficient
 - Expand a binomial using the binomial theorem
 - Use the binomial theorem to find a single term
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15.7 Probability

- Basic Probability
 - Compute the probability of equally likely outcomes
 - Compute the probability of the union of two events
 - Use the complement rule to compute probabilities
 - Compute probability using counting theory
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