

Survey of Mathematics



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Source	Author(s) (Text or Video)	Title(s)	Link (where applicable)
OpenStax	Various	Various	OpenStax
Mathispower4u	James Sousa	MathIsPower4U	Mathispower4U Videos

Alta Survey of Mathematics was developed to meet the scope and sequence of a typical one-semester survey of mathematics course. To develop the course, Knewton used a variety of different source content, including OpenStax, videos created by a Math Professor we have partnered with, 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 Survey of Mathematics has two instructional sequences for every learning objective, giving students multiple opportunities to learn new concepts. Between our OpenStax, video, and Knewton SMEs, we were able to solicit ideas from math instructors and students at all levels of higher education. Alta Survey of Mathematics covers the typical breadth of survey topics, and also provides the necessary depth to ensure the course is manageable and engaging for instructors and students alike.

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Chapter 1: Critical Thinking Skills

1.1 Inductive and Deductive Reasoning

- Inductive and Deductive Reasoning
 - Understand and use inductive reasoning
 - Understand and use deductive reasoning

1.2 Estimation

- Estimation by Rounding
 - Estimate a value by rounding a whole number
 - Estimate a value by rounding a decimal
- Estimation from Graphs/Figures
 - Estimate using a pie chart or bar graph
 - Estimate using a line graph

1.3 Problem Solving

- Problem Solving
 - Identify the piece of information needed to solve a problem and unnecessary information given in a problem
 - Solve an application problem by applying Polya's four step procedure

Chapter 2: Sets

2.1 Set Concepts

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 - Represent a set using set builder notation
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 - Determine if two sets are equal
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2.2 Venn Diagrams and Set Operations

- Representing Sets with Venn Diagrams
 - Illustrate the universal set, a set, and complement of a set using a Venn diagram
 - Illustrate two sets using Venn diagram and set notation
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- Set Relationships
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 - Determine the intersection of two sets using Venn diagrams and set notation
 - Determine the union of two sets using Venn diagrams and set notation
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- Construct a Venn Diagram of Three Sets
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2.4 Applications of Sets

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- Euler Diagrams and Syllogistic Arguments
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- Early Computational Methods
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- Introduction to Integers
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5.5 Real Numbers and Their Properties

- Properties of Real Numbers
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5.6 Rules of Exponents and Scientific Notation

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5.7 Arithmetic and Geometric Sequences

- Arithmetic Sequences
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 - Write terms of an arithmetic sequence
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6.3 Formulas

- Using Formulas
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6.5 Variation

- Solving Variation Problems
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 - Find equation, in slope-intercept form, of a line passing through two given points
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- Vertical, Horizontal, Parallel, and Perpendicular Lines
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- Linear Inequalities in Two Variables
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6.11 Exponential Functions

- Identify and Evaluate Exponential Functions
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 - Evaluate exponential functions
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Chapter 7: Systems of Linear Equations and Inequalities

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7.2 Solving Systems of Linear Equations by the Substitution and Addition Methods

- Solving Systems of Linear Equations
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7.5 Systems of Linear Inequalities

- Solving Systems of Linear Inequalities
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- Mass and Temperature
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- Points, Lines, and Planes
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 - Use properties of similar polygons to solve for a missing side
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-

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-

Chapter 10: Mathematical Systems

10.1 Mathematical Systems

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- Properties of a Mathematical System
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Chapter 12: Probability and Counting Methods

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- The Fundamental Counting Principle
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- Fundamentals of Probability
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-

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- Random Variables, Probability Distributions, and Expected Value
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Chapter 13: Statistics

13.1 Sampling, Frequency Distributions, and Graphs

- Sampling and Parameters
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- Modes, Midranges, and Choosing a Measurement
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Chapter 14: Graph Theory

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15.3 Apportionment Methods

- Standard Divisors and Standard Quotas
 - Determine the standard quota for a state given its population
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-

- Apportionment Methods
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- Flaws of the Apportionment Methods
 - Identify where the Alabama paradox occurs
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-