

Course Description:

From construction to physics, the concepts in this course are used in a variety of real-world situations. In this course, students use their knowledge about equations and inequalities to model real-life situations. They will expand their skills with regard to solving equations, including how to solve exponential equations with logarithms. They will also synthesize and generalize a variety of function families.

As students work through this course, they will complete 30 lessons that have a similar structure. Each lesson pair starts with a refresher of previous concepts, where they work through a few problems. After that, they move on to activities in which the lesson is taught by watching videos and working through an interactive text activity. They will then answer the Workbook questions. After that, students interact with peers in the discussion board to talk about what they are learning in the lesson. Then they complete a Checkpoint quiz or Unit Exam. This course also includes a Close Reading exercise, where students will read an article about global warming, perform some research, and then write an essay on the topic. Lesson 31 is a review of the concepts from each unit and students take the Final Exam.

Course Objectives:

- Create equations and inequalities in one variable and use them to solve problems.
- Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.
- Represent constraints by equations or inequalities, and by systems of equations and/or inequalities, and interpret solutions as viable or non-viable options in a modeling context.
- Rearrange formulas to highlight a quantity of interest.
- Write functions defined by expressions in different but equivalent forms.
- Find inverse functions.
- Express logarithms as solutions to exponential models.
- Use key features to identify and graph logarithmic functions.
- Analyze mapping statements in order to identify and graph translations of functions.
- Calculate and compare the average rate of change of different functions.
- Identify the differences and similarities between average rate of change and instantaneous rate of change.
- Examine key features in graphs and tables in order to identify the family function.
- Determine the best family function to model different situations.

Required Materials:

In course.

Schedule of Work:

Unit 1: Equations and Inequalities, Part 1

- Math Muscle Exercise (Lessons 3 and 5)
- Direct Instruction
 - Key Terms

- Text and Videos: Single-Variable Equations and Inequalities, Part 1; Single-Variable Equations and Inequalities, Part 2; Multivariable Equations and Inequalities, Part 1; Multivariable Equations and Inequalities, Part 2; Multivariable Systems of Equations, Part 1; Multivariable Systems of Equations, Part 2
 - Workbook assessments
- Discussion (Lessons 2, 4, and 6)
 - Checkpoint assessments (Lessons 2 and 4)
 - Unit 1 Exam (Lesson 6)
- Unit 2: Equations and Inequalities, Part 2
- Math Muscle Exercise (Lessons 7 and 9)
 - Direct Instruction
 - Key Terms
 - Text and Videos: Multivariable Systems of Inequalities, Part 1; Multivariable Systems of Inequalities, Part 2; Optimization and Linear Programming, Part 1; Optimization and Linear Programming, Part 2
 - Workbook assessments
 - Discussion (Lessons 8 and 10)
 - Checkpoint assessments (Lesson 8)
 - Unit 2 Exam (Lesson 10)
 - Close Reading (Lesson 10)
- Unit 3: Inversion, Part 1
- Math Muscle Exercise (Lessons 11, 13, and 15)
 - Direct Instruction
 - Key Terms
 - Text and Videos: Rearranging Formulas and Isolating Variables, Part 1; Rearranging Formulas and Isolating Variables, Part 2; Rewriting Exponentials, Part 1; Rewriting Exponentials, Part 2; Inverse Functions, Part 1; Inverse Functions, Part 2
 - Workbook assessments
 - Discussion (Lessons 12, 14, and 16)
 - Checkpoint assessments (Lessons 12 and 14)
 - Unit 3 Exam (Lesson 16)
- Unit 4: Inversion, Part 2
- Math Muscle Exercise (Lessons 17 and 19)
 - Direct Instruction
 - Key Terms
 - Text and Videos: Logarithms, Part 1; Logarithms, Part 2; Logarithms, Part 3; Logarithms, Part 4
 - Workbook assessments
 - Discussion (Lessons 18 and 20)
 - Checkpoint assessments (Lesson 18)
 - Unit 4 Exam (Lesson 20)
- Unit 5: Function Models, Part 1
- Math Muscle Exercises (Lessons 21, 23, and 25)
 - Direct Instruction
 - Key Terms

- Text and Videos: Graphing Logarithms, Part 1; Graphing Logarithms, Part 2; Transformations of Graphs, Part 1; Transformations of Graphs, Part 2; Average Rates of Change, Part 1; Average Rates of Change, Part 2
- Workbook assessments
- Discussion (Lessons 22, 24, and 26)
- Checkpoint assessments (Lessons 22 and 24)
- Unit 5 Exam (Lesson 26)

Unit 6: Function Models, Part 2

- Math Muscle Exercises (Lessons 27 and 29)
- Direct Instruction
 - Key Terms
 - Text and Videos: Exploring Function Families, Part 1; Exploring Function Families, Part 2; Building Models, Part 1; Building Models, Part 2; Review
 - Workbook assessments
- Units 1–6 Review (Lesson 31)
- Discussion (Lessons 28 and 30)
- Checkpoint assessments (Lesson 28)
- Unit 6 Exam (Lesson 29)
- Course Final Exam (Lesson 31)