

Mathematics III incorporates advanced functions, trigonometry, and probability and statistics as students synthesize their prior knowledge and solve increasingly challenging problems. Students learn through discovery and application, developing the skills they need to break down complex challenges and demonstrate their knowledge in new situations.

Course topics include formulating inferences and conclusions from data; polynomial, rational, and radical relationships; trigonometry of general triangles and trigonometric functions; and mathematical modeling.

This course supports all students as they simultaneously develop computational fluency, deepen conceptual understanding, and apply mathematical practice skills. Students begin each lesson by discovering new concepts through guided instruction, and then confirm their understanding in an interactive, feedback-rich environment. Modeling activities equip students with tools for analyzing a variety of real-world scenarios and mathematical ideas. Journaling activities allow students to reason abstractly and quantitatively, construct arguments, critique reasoning, and communicate precisely. Performance tasks prepare students to synthesize their knowledge in novel, real-world scenarios and require that they make sense of multifaceted problems and persevere in solving them. Throughout the course students are evaluated through a diversity of assessments specifically designed to prepare them for the content, form, and depth of state assessments.

This course is built to state standards.

Length: Two Semesters

## UNIT 1: STATISTICAL ANALYSIS

### LESSON 1: REVIEW OF GRAPHICAL ANALYSIS OF DATA

#### Study: Review of Graphical Analysis of Data

Learn about the different ways to express data graphically and the various shapes or properties these representations have.

Duration: 0 hrs 35 mins Scoring: 0 points

#### Checkpoint: Practice Problems

Complete a set of practice problems to check your understanding of the lesson.

Duration: 0 hrs 25 mins Scoring: 0 points

#### Quiz: Types of Data Displays

Take a quiz to check your understanding of what you have learned.

Duration: 0 hrs 20 mins Scoring: 20 points

#### Quiz: Graphical Data Analysis

Take a quiz to check your understanding of what you have learned.

Duration: 0 hrs 20 mins Scoring: 20 points

### LESSON 2: REVIEW OF NUMERICAL ANALYSIS OF DATA

#### Study: Review of Numerical Analysis of Data

Learn about the numerical analysis of data as it relates to means, medians, modes, IQR, outliers, test quartiles, box plots, variance, and standard deviation.

Duration: 0 hrs 35 mins Scoring: 0 points

#### Checkpoint: Practice Problems

Complete a set of practice problems to check your understanding of the lesson.

Duration: 0 hrs 25 mins Scoring: 0 points

#### Quiz: Measures of Central Tendency

Take a quiz to check your understanding of what you have learned.

Duration: 0 hrs 20 mins Scoring: 20 points

### **Quiz: Quartiles and Box Plots**

Take a quiz to check your understanding of what you have learned.

Duration: 0 hrs 20 mins Scoring: 20 points

### **Quiz: Measures of Spread**

Take a quiz to check your understanding of what you have learned.

Duration: 0 hrs 20 mins Scoring: 20 points

## **LESSON 3: DATA GATHERING AND INFERENCE STATISTICS**

### **Study: Data Gathering and Inferential Statistics**

Investigate techniques for gathering data and explore how probability is used in statistical inference.

Duration: 0 hrs 35 mins Scoring: 0 points

### **Checkpoint: Practice Problems**

Complete a set of practice problems to check your understanding of the lesson.

Duration: 0 hrs 25 mins Scoring: 0 points

### **Quiz: Data Gathering and Inference**

Take a quiz to check your understanding of what you have learned.

Duration: 0 hrs 20 mins Scoring: 20 points

## **LESSON 4: RANDOM VARIABLES**

### **Study: Random Variables**

Explore random variable concepts such as discrete continuous variables, histograms, density curves, mean, standard deviation of discrete random variables, normal curve, and  $z$ -score percentiles.

Duration: 0 hrs 35 mins Scoring: 0 points

### **Checkpoint: Practice Problems**

Complete a set of practice problems to check your understanding of the lesson.

Duration: 0 hrs 25 mins Scoring: 0 points

### **Quiz: Random Variables**

Take a quiz to check your understanding of what you have learned.

Duration: 0 hrs 20 mins Scoring: 20 points

### **Quiz: Normal Curves**

Take a quiz to check your understanding of what you have learned.

Duration: 0 hrs 20 mins Scoring: 20 points

### **Journal: Cell Phone Battery Life**

Evaluate the design and results of an experiment with a peer.

Duration: 0 hrs 30 mins Scoring: 20 points

## **LESSON 5: EXPERIMENTAL DESIGN**

### **Study: Experimental Design**

Learn how to design and carry out an experiment employing the basic principles of experimental design.

Duration: 0 hrs 35 mins Scoring: 0 points

### **Checkpoint: Practice Problems**

Complete a set of practice problems to check your understanding of the lesson.

Duration: 0 hrs 25 mins Scoring: 0 points

### **Quiz: Sampling and Simulation**

Take a quiz to check your understanding of what you have learned.

Duration: 0 hrs 20 mins Scoring: 20 points

### **Quiz: Experimental Design**

Take a quiz to check your understanding of what you have learned.

Duration: 0 hrs 20 mins Scoring: 20 points

## LESSON 6: EVALUATING PUBLISHED REPORTS

### Study: Evaluating Published Reports

Learn how to evaluate the design of a study, the appropriateness of its analysis, and the validity of its conclusions.

Duration: 0 hrs 35 mins Scoring: 0 points

### Checkpoint: Practice Problems

Complete a set of practice problems to check your understanding of the lesson.

Duration: 0 hrs 25 mins Scoring: 0 points

### Quiz: Evaluating Published Reports

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 20 mins Scoring: 20 points

## LESSON 7: APPLICATIONS OF STATISTICAL TECHNIQUES

### Study: Applications of Statistical Techniques

Learn how statistical techniques are used to analyze real-world observational studies and experimental designs.

Duration: 0 hrs 35 mins Scoring: 0 points

### Checkpoint: Practice Problems

Complete a set of practice problems to check your understanding of the lesson.

Duration: 0 hrs 25 mins Scoring: 0 points

### Quiz: Applications of Statistical Techniques

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 20 mins Scoring: 20 points

### Practice: Statistical Truth or Fiction?

Evaluate gathered data and make a prediction using statistical techniques.

Duration: 0 hrs 30 mins Scoring: 20 points

## LESSON 8: STATISTICAL ANALYSIS WRAP-UP

### Checkpoint: Assignment

Submit your work for a set of 20 practice problems.

Duration: 0 hrs 25 mins

### Review: Statistical Analysis

Get ready for the unit test by reviewing important ideas and skills.

Duration: 0 hrs 20 mins Scoring: 0 points

### Test (CS): Statistical Analysis

Take a computer-scored test to check what you have learned in this unit.

Duration: 0 hrs 40 mins Scoring: 50 points

### Test (TS): Statistical Analysis

Take a teacher-scored test to check what you have learned in this unit.

Duration: 0 hrs 30 mins Scoring: 50 points

## UNIT 2: FUNCTIONS

### LESSON 1: WHAT IS A FUNCTION?

#### Study: Relating to Functions

Learn about functions, their graphs, and some special functions.

Duration: 0 hrs 35 mins

#### Checkpoint: Practice Problems

Complete a set of practice problems on functions.

Duration: 0 hrs 25 mins Scoring: 0 points

### **Quiz: What Is a Function?**

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 20 mins Scoring: 20 points

## **LESSON 2: GRAPHING FUNCTIONS**

### **Study: Graphing Functions**

Learn the vertical line and horizontal line tests for evaluating a function. Evaluate a function for given values and explore special functions.

Duration: 0 hrs 35 mins

### **Checkpoint: Practice Problems**

Complete a set of practice problems on graphing functions.

Duration: 0 hrs 25 mins

### **Quiz: Graphing Functions**

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 20 mins Scoring: 20 points

## **LESSON 3: LINEAR FUNCTIONS**

### **Study: Linear Functions**

Learn about slope and the three main forms of linear functions.

Duration: 0 hrs 35 mins

### **Checkpoint: Practice Problems**

Complete a set of practice problems on linear functions.

Duration: 0 hrs 25 mins

### **Quiz: Linear Functions**

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 20 mins Scoring: 20 points

## **LESSON 4: LINEAR EQUATIONS AND INEQUALITIES**

### **Study: Linear Equations and Inequalities**

Learn how to solve linear equations and inequalities.

Duration: 0 hrs 35 mins

### **Checkpoint: Practice Problems**

Complete a set of practice problems on linear equations and inequalities.

Duration: 0 hrs 25 mins

### **Quiz: Linear Equations and Inequalities**

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 20 mins Scoring: 20 points

### **Journal: The Summer Job**

Work through a real-world problem involving linear equations and inequalities.

Duration: 0 hrs 30 mins Scoring: 20 points

## **LESSON 5: SOLVING LITERAL EQUATIONS AND FORMULAS**

### **Study: Solving Literal Equations and Formulas**

Learn how to solve literal equations for one variable.

Duration: 0 hrs 35 mins Scoring: 0 points

### **Checkpoint: Practice Problems**

Check your understanding of the lesson.

Duration: 0 hrs 25 mins Scoring: 0 points

### Quiz: Solving Literal Equations and Formulas

Take a quiz to check your understanding of what you have learned.

Duration: 0 hrs 20 mins Scoring: 20 points

## LESSON 6: LINEAR SYSTEMS

### Study: Finding the Point of Intersection

Find the point of intersection of linear systems using algebra, graphing, and matrices.

Duration: 0 hrs 35 mins

### Study: Connection to Business: Linear Programming

Learn how businesses solve problems using linear programming.

Duration: 0 hrs 35 mins

### Checkup: Practice Problems

Complete a set of practice problems on linear systems.

Duration: 0 hrs 25 mins

### Quiz: Linear Systems

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 20 mins Scoring: 20 points

## LESSON 7: QUADRATIC FUNCTIONS

### Study: Quadratic Functions

Relate factors of a quadratic function to the graph of a parabola and its corresponding  $x$ -intercepts. Locate the vertex of a quadratic function graphically and algebraically. Use the discriminant of the quadratic formula to identify the number and types of solutions to a given quadratic equation, as well as to visualize its corresponding graph.

Duration: 0 hrs 35 mins Scoring: 0 points

### Checkup: Practice Problems

Complete a set of practice problems to check your understanding of the lesson.

Duration: 0 hrs 25 mins Scoring: 0 points

### Quiz: Quadratic Functions

Take a quiz to check your understanding of what you have learned.

Duration: 0 hrs 20 mins Scoring: 20 points

### Quiz: Working with the Discriminant

Take a quiz to check your understanding of what you have learned.

Duration: 0 hrs 20 mins Scoring: 20 points

### Practice: Modeling: Pumpkin Launch

Model a graph with real world data.

Duration: 0 hrs 30 mins Scoring: 20 points

## LESSON 8: NONLINEAR SYSTEMS OF EQUATIONS

### Study: Nonlinear Systems of Equations

Learn about solution sets for nonlinear systems of equations, solving nonlinear systems of equations using the substitution method, choosing which variable to isolate, substituting a squared variable, and determining the number of solutions. Explore a human-cannonball case study.

Duration: 0 hrs 35 mins Scoring: 0 points

### Checkup: Practice Problems

Complete a set of practice problems to check your understanding of the lesson.

Duration: 0 hrs 25 mins Scoring: 0 points

### Quiz: Nonlinear Systems of Equations

Take a quiz to check your understanding of what you have learned.

Duration: 0 hrs 20 mins Scoring: 20 points

## LESSON 9: NONLINEAR SYSTEMS OF INEQUALITIES

### Study: Nonlinear Systems of Inequalities

Learn about solution sets for and graphs of nonlinear inequalities; boundaries of parabolas; three steps to graphing nonlinear inequalities; and nonlinear systems of inequalities.

Duration: 0 hrs 35 mins Scoring: 0 points

### Checkpoint: Practice Problems

Complete a set of practice problems to check your understanding of the lesson.

Duration: 0 hrs 25 mins Scoring: 0 points

### Quiz: Nonlinear Inequalities

Take a quiz to check your understanding of what you have learned.

Duration: 0 hrs 20 mins Scoring: 20 points

## LESSON 10: FUNCTIONS WRAP-UP

### Checkpoint: Practice Problems

Check your understanding of the unit.

Duration: 0 hrs 25 mins Scoring: 0 points

### Review: Functions

Get ready for the unit test by reviewing important ideas and skills.

Duration: 0 hrs 20 mins Scoring: 0 points

### Test (CS): Functions

Take a computer-scored test to check what you have learned in this unit.

Duration: 0 hrs 40 mins Scoring: 50 points

### Test (TS): Functions

Take a teacher-scored test to check what you have learned in this unit.

Duration: 0 hrs 30 mins Scoring: 50 points

## UNIT 3: TRANSFORMING FUNCTIONS

### LESSON 1: INVERSES

#### Study: Inverses

Learn about undoing functions, mapping diagrams of inverse functions, and finding the equations for inverse functions.

Duration: 0 hrs 35 mins Scoring: 0 points

#### Checkpoint: Practice Problems

Complete a set of practice problems to check your understanding of the lesson.

Duration: 0 hrs 25 mins Scoring: 0 points

#### Quiz: Inverses with Variables $x$ and $y$

Take a quiz to check your understanding of what you have learned.

Duration: 0 hrs 20 mins Scoring: 20 points

#### Quiz: Inverses with Other Variables

Take a quiz to check your understanding of what you have learned.

Duration: 0 hrs 20 mins Scoring: 20 points

### LESSON 2: GRAPHS OF INVERSES

#### Study: Graphs of Inverses

Learn how to convert the graph of a given function to the graph of its inverse by swapping coordinates of all ordered pairs. Use mapping diagrams, horizontal line tests, and the concept of symmetry across the line  $y = x$  to determine if the inverse of a given function is also a function.

Duration: 0 hrs 35 mins Scoring: 0 points

#### Checkpoint: Practice Problems

Complete a set of practice problems to check your understanding of the lesson.

Duration: 0 hrs 25 mins Scoring: 0 points

### Quiz: Graphs of Inverses

Take a quiz to check your understanding of what you have learned.

Duration: 0 hrs 20 mins Scoring: 20 points

### Journal: Inverting Time and Temperature

Model the rate of melting ice using a graph, and experiment with inverting the axes.

Duration: 0 hrs 30 mins Scoring: 20 points

## LESSON 3: PARENT FUNCTIONS

### Study: Parent Functions

Learn about the properties and graphs of linear parent functions, quadratic parent functions, absolute value parent functions, and reciprocal parent functions.

Duration: 0 hrs 35 mins Scoring: 0 points

### Checkup: Practice Problems

Complete a set of practice problems to check your understanding of the lesson.

Duration: 0 hrs 25 mins Scoring: 0 points

### Quiz: Parent Functions

Take a quiz to check your understanding of what you have learned.

Duration: 0 hrs 20 mins Scoring: 20 points

## LESSON 4: SHIFTING FUNCTIONS

### Study: Shifting Functions

Learn about shifting graphs of functions up/down and left/right by changing the coordinates of each ordered pair. Learn about changing the equation of a function to shift its graph vertically or horizontally and about combining vertical and horizontal shifts.

Duration: 0 hrs 35 mins Scoring: 0 points

### Checkup: Practice Problems

Complete a set of practice problems to check your understanding of the lesson.

Duration: 0 hrs 25 mins Scoring: 0 points

### Quiz: Shifting Functions Vertically

Take a quiz to check your understanding of what you have learned.

Duration: 0 hrs 20 mins Scoring: 20 points

### Quiz: Shifting Functions Horizontally

Take a quiz to check your understanding of what you have learned.

Duration: 0 hrs 20 mins Scoring: 20 points

### Quiz: Shifting Functions Vertically and Horizontally

Take a quiz to check your understanding of what you have learned.

Duration: 0 hrs 20 mins Scoring: 20 points

## LESSON 5: STRETCHING FUNCTIONS VERTICALLY

### Study: Stretching Functions Vertically

Learn about vertically stretching or compressing a function's graph by multiplying by a constant; flipping the graph by multiplying by a negative constant; and combining vertical stretches with vertical or horizontal shifts.

Duration: 0 hrs 35 mins Scoring: 0 points

### Checkup: Practice Problems

Complete a set of practice problems to check your understanding of the lesson.

Duration: 0 hrs 25 mins Scoring: 0 points

### Quiz: Stretching Functions Vertically

Take a quiz to check your understanding of what you have learned.

Duration: 0 hrs 20 mins Scoring: 20 points

## LESSON 6: TRANSFORMATION OF PARENT FUNCTIONS

### Study: Transformation of Parent Functions

Learn how to perform vertical shifts, horizontal shifts, vertical stretches and compressions, horizontal stretches and compressions, and any combination of these transformations on parent functions.

Duration: 0 hrs 35 mins Scoring: 0 points

### Checkup: Practice Problems

Complete a set of practice problems to check your understanding of the lesson.

Duration: 0 hrs 25 mins Scoring: 0 points

### Quiz: Transformation of Parent Functions

Take a quiz to check your understanding of what you have learned.

Duration: 0 hrs 20 mins Scoring: 20 points

### Practice: Transformations of Parent Functions

Use the modeling tool to transform a function.

Duration: 0 hrs 30 mins Scoring: 20 points

## LESSON 7: ARITHMETIC OF FUNCTIONS

### Study: Arithmetic of Functions

Learn how to add, subtract, multiply, divide, and compose functions.

Duration: 0 hrs 35 mins

### Checkup: Practice Problems

Complete a set of practice problems on the arithmetic of functions.

Duration: 0 hrs 25 mins

### Quiz: Arithmetic of Functions

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 20 mins Scoring: 20 points

## LESSON 8: PERFORMANCE TASK: TRANSFORMING FUNCTIONS

### Study: Solving the Ball-Tossing Problem

Create an equation using data from a table, and graph the result.

Duration: 0 hrs 35 mins Scoring: 0 points

### Project: Performance Task: 3-D Printer Business

Create an equation using data from a table, and graph the result.

Duration: 2 hrs Scoring: 150 points

## LESSON 9: TRANSFORMING FUNCTIONS WRAP-UP

### Checkup: Practice Problems

Submit your work for a set of 20 practice problems.

Duration: 0 hrs 25 mins Scoring: 0 points

### Review: Transforming Functions

Get ready for the unit test by reviewing important ideas and skills.

Duration: 0 hrs 20 mins Scoring: 0 points

### Test (CS): Transforming Functions

Take a computer-scored test to check what you have learned in this unit.

Duration: 0 hrs 40 mins Scoring: 50 points

### Test (TS): Transforming Functions

Take a teacher-scored test to check what you have learned in this unit.

Duration: 0 hrs 30 mins Scoring: 50 points



## UNIT 4: POLYNOMIAL FUNCTIONS

### LESSON 1: POLYNOMIAL BASICS

#### Study: Polynomial Basics

Learn that polynomials form a system analogous to the integers, namely, they are closed under the operations of addition, subtraction, and multiplication; add, subtract, and multiply polynomials.

Duration: 0 hrs 35 mins Scoring: 0 points

#### Checkup: Practice Problems

Check your understanding of the lesson.

Duration: 0 hrs 25 mins Scoring: 0 points

#### Quiz: Polynomial Basics

Take a quiz to check your understanding of what you have learned.

Duration: 0 hrs 20 mins Scoring: 20 points

#### Practice: Multiplying Polynomials

Use tiles to model the multiplication of binomials and solve a real-world problem.

Duration: 0 hrs 30 mins Scoring: 20 points

### LESSON 2: POLYNOMIAL FUNCTIONS

#### Study: Polynomial Functions

Learn to identify, classify, evaluate, and graph polynomial functions and expressions. Practice writing polynomials in descending order, as well as using the degree of a given polynomial function to predict the general shape of its graph.

Duration: 0 hrs 35 mins Scoring: 0 points

#### Checkup: Practice Problems

Complete a set of practice problems to check your understanding of the lesson.

Duration: 0 hrs 25 mins Scoring: 0 points

#### Quiz: Polynomial Functions

Take a quiz to check your understanding of what you have learned.

Duration: 0 hrs 20 mins Scoring: 20 points

### LESSON 3: WORKING WITH COMPLEX NUMBERS

#### Study: Working with Complex Numbers

Learn about imaginary and complex numbers, perform basic arithmetic operations on complex numbers, and solve equations with imaginary and complex numbers.

Duration: 0 hrs 35 mins Scoring: 0 points

#### Checkup: Practice Problems

Complete a set of practice problems to check your understanding of the lesson.

Duration: 0 hrs 25 mins Scoring: 0 points

#### Quiz: Working with Complex Numbers

Take a quiz to check your understanding of what you have learned.

Duration: 0 hrs 20 mins Scoring: 20 points

#### Quiz: Operations on Complex Numbers

Take a quiz to check your understanding of what you have learned.

Duration: 0 hrs 20 mins Scoring: 20 points

#### Quiz: Quadratics With Complex Solutions

Take a quiz to check your understanding of what you have learned.

Duration: 0 hrs 20 mins Scoring: 20 points

### LESSON 4: SYNTHETIC DIVISION

#### Study: Synthetic Division

Learn two methods for dividing polynomials — long division and synthetic division. Use synthetic division to expedite

the process of finding factors and roots of polynomial expressions.

Duration: 0 hrs 35 mins Scoring: 0 points

### **Checkpoint: Practice Problems**

Complete a set of practice problems to check your understanding of the lesson.

Duration: 0 hrs 25 mins Scoring: 0 points

### **Quiz: Synthetic Division**

Take a quiz to check your understanding of what you have learned.

Duration: 0 hrs 20 mins Scoring: 20 points

## **LESSON 5: FACTORING POLYNOMIALS COMPLETELY**

### **Study: Factoring Polynomials Completely**

Learn about the remainder-factor theorem, rational-roots theorem, complex-conjugate theorem, and conjugate-radical theorem. Learn to use synthetic division to factor higher-order polynomials.

Duration: 0 hrs 35 mins Scoring: 0 points

### **Checkpoint: Practice Problems**

Complete a set of practice problems to check your understanding of the lesson.

Duration: 0 hrs 25 mins Scoring: 0 points

### **Quiz: Remainder and Factor Theorems**

Take a quiz to check your understanding of what you have learned.

Duration: 0 hrs 20 mins Scoring: 20 points

### **Quiz: Factoring Polynomials Completely**

Take a quiz to check your understanding of what you have learned.

Duration: 0 hrs 20 mins Scoring: 20 points

## **LESSON 6: SOLVING POLYNOMIAL EQUATIONS**

### **Study: Solving Polynomial Equations**

Find all solutions to polynomial equations.

Duration: 0 hrs 35 mins

### **Checkpoint: Practice Problems**

Complete a set of practice problems on solving polynomial equations.

Duration: 0 hrs 25 mins

### **Quiz: Solving Polynomial Equations**

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 20 mins Scoring: 20 points

## **LESSON 7: GRAPHING POLYNOMIAL FUNCTIONS**

### **Study: Graphs of Polynomial Functions**

Learn to graph polynomial functions, identify zeros and write a polynomial function from its zeros.

Duration: 0 hrs 35 mins Scoring: 0 points

### **Checkpoint: Practice Problems**

Check your understanding of the lesson.

Duration: 0 hrs 25 mins Scoring: 0 points

### **Quiz: Graphs of Polynomial Functions**

Take a quiz to check your understanding of what you have learned.

Duration: 0 hrs 20 mins Scoring: 20 points

### **Journal: Designing a Mountain Landscape**

Discuss with a peer the process for using binomials to design a curved mountain landscape.

Duration: 0 hrs 30 mins Scoring: 20 points

## LESSON 8: POLYNOMIAL IDENTITIES

### Study: Polynomial Identities

Prove polynomial identities and use them to describe numerical relationships.

Duration: 0 hrs 35 mins Scoring: 0 points

### Checkpoint: Practice Problems

Check your understanding of the lesson.

Duration: 0 hrs 25 mins Scoring: 0 points

### Quiz: Polynomial Identities

Take a quiz to check your understanding of what you have learned.

Duration: 0 hrs 20 mins Scoring: 20 points

## LESSON 9: BINOMIAL THEOREM

### Study: Binomial Theorem

Learn and apply the binomial theorem.

Duration: 0 hrs 35 mins Scoring: 0 points

### Checkpoint: Practice Problems

Check your understanding of the lesson.

Duration: 0 hrs 25 mins Scoring: 0 points

### Quiz: Binomial Theorem

Take a quiz to check your understanding of what you have learned.

Duration: 0 hrs 20 mins Scoring: 20 points

## LESSON 10: T TRANSFORMATIONS OF POLYNOMIAL FUNCTIONS

### Study: Transformations of Polynomial Functions

Transform polynomial functions.

Duration: 0 hrs 35 mins Scoring: 0 points

### Checkpoint: Practice Problems

Check your understanding of the lesson.

Duration: 0 hrs 25 mins Scoring: 0 points

### Quiz: Transformations of Polynomial Functions

Take a quiz to check your understanding of what you have learned.

Duration: 0 hrs 20 mins Scoring: 20 points

## LESSON 11: POLYNOMIAL FUNCTIONS WRAP-UP

### Checkpoint: Practice Problems

Check your understanding of the unit.

Duration: 0 hrs 25 mins Scoring: 0 points

### Review: Polynomial Functions

Get ready for the unit test by reviewing important ideas and skills.

Duration: 0 hrs 20 mins Scoring: 0 points

### Test (CS): Polynomial Functions

Take a computer-scored test to check what you have learned in this unit.

Duration: 0 hrs 40 mins Scoring: 50 points

### Test (TS): Polynomial Functions

Take a teacher-scored test to check what you have learned in this unit.

Duration: 0 hrs 30 mins Scoring: 50 points

## UNIT 5: RATIONAL EXPRESSIONS AND FUNCTIONS

### LESSON 1: PROPORTIONS

**Study: Proportions**

Learn the definition of a rational expression and about using proportional reasoning to solve problems. Explore real-world examples of proportional reasoning.

Duration: 0 hrs 35 mins Scoring: 0 points

**Checkpoint: Practice Problems**

Complete a set of practice problems to check your understanding of the lesson.

Duration: 0 hrs 25 mins Scoring: 0 points

**Quiz: Proportions**

Take a quiz to check your understanding of what you have learned.

Duration: 0 hrs 20 mins Scoring: 20 points

**LESSON 2: RATIONAL EXPRESSIONS****Study: Rational Expressions**

Learn about finding the value of a rational expression and about undefined rational expressions.

Duration: 0 hrs 35 mins Scoring: 0 points

**Checkpoint: Practice Problems**

Complete a set of practice problems to check your understanding of the lesson.

Duration: 0 hrs 25 mins Scoring: 0 points

**Quiz: Rational Expressions**

Take a quiz to check your understanding of what you have learned.

Duration: 0 hrs 20 mins Scoring: 20 points

**LESSON 3: SIMPLIFYING RATIONAL EXPRESSIONS****Study: Simplifying Rational Expressions**

Practice finding and dividing out common factors in numerators and denominators of rational expressions. Explore the crucial difference between common factors and terms.

Duration: 0 hrs 35 mins Scoring: 0 points

**Checkpoint: Practice Problems**

Complete a set of practice problems to check your understanding of the lesson.

Duration: 0 hrs 25 mins Scoring: 0 points

**Quiz: Simplifying Rational Expressions**

Take a quiz to check your understanding of what you have learned.

Duration: 0 hrs 20 mins Scoring: 20 points

**LESSON 4: MULTIPLYING AND DIVIDING RATIONAL EXPRESSIONS****Study: Multiplying and Dividing Rational Expressions**

Review multiplying and dividing numerical fractions, multiplying rational expressions, dividing rational expressions, and simplifying the results.

Duration: 0 hrs 35 mins Scoring: 0 points

**Checkpoint: Practice Problems**

Complete a set of practice problems to check your understanding of the lesson.

Duration: 0 hrs 25 mins Scoring: 0 points

**Quiz: Multiplying Rational Expressions**

Take a quiz to check your understanding of what you have learned.

Duration: 0 hrs 20 mins Scoring: 20 points

**Quiz: Dividing Rational Expressions**

Take a quiz to check your understanding of what you have learned.

Duration: 0 hrs 20 mins Scoring: 20 points

**LESSON 5: ADDING AND SUBTRACTING RATIONAL EXPRESSIONS**

**Study: Adding and Subtracting Rational Expressions**

Review adding and subtracting numerical fractions, adding and subtracting rational expressions with like denominators, finding least common denominators, finding multiples of rational expressions, and adding and subtracting rational expressions with unlike denominators.

Duration: 0 hrs 35 mins Scoring: 0 points

**Checkpoint: Practice Problems**

Complete a set of practice problems to check your understanding of the lesson.

Duration: 0 hrs 25 mins Scoring: 0 points

**Quiz: Adding and Subtracting Rational Expressions**

Take a quiz to check your understanding of what you have learned.

Duration: 0 hrs 20 mins Scoring: 20 points

**LESSON 6: INVERSE VARIATION****Study: Inverse Variation**

Review direct variation and how increasing input leads to proportionally increasing output. Review inverse variation and how increasing input leads to proportionally decreasing output. Review finding the constant of variation.

Duration: 0 hrs 35 mins Scoring: 0 points

**Checkpoint: Practice Problems**

Complete a set of practice problems to check your understanding of the lesson.

Duration: 0 hrs 25 mins Scoring: 0 points

**Quiz: Inverse Variation**

Take a quiz to check your understanding of what you have learned.

Duration: 0 hrs 20 mins Scoring: 20 points

**Practice: Finding the Constant in Inverse Variation**

Create a graph using a table of inverse variation data, and determine a constant value to create an approximate functional model.

Duration: 0 hrs 30 mins Scoring: 20 points

**LESSON 7: SOLVING RATIONAL FUNCTIONS****Study: Solving Rational Functions**

Learn the definition of a rational function and how to find the domain of a given function. Explore the horizontal and vertical asymptotes of rational functions.

Duration: 0 hrs 35 mins Scoring: 0 points

**Checkpoint: Practice Problems**

Complete a set of practice problems to check your understanding of the lesson.

Duration: 0 hrs 25 mins Scoring: 0 points

**Quiz: Solving Rational Functions**

Take a quiz to check your understanding of what you have learned.

Duration: 0 hrs 20 mins Scoring: 20 points

**LESSON 8: VERTICAL ASYMPTOTES****Study: Vertical Asymptotes**

Learn about graphs of rational functions, about finding vertical asymptotes, and about graphing rational functions with more than one vertical asymptote.

Duration: 0 hrs 35 mins Scoring: 0 points

**Checkpoint: Practice Problems**

Complete a set of practice problems to check your understanding of the lesson.

Duration: 0 hrs 25 mins Scoring: 0 points

**Quiz: Finding Vertical Asymptotes**

Take a quiz to check your understanding of what you have learned.

Duration: 0 hrs 20 mins Scoring: 20 points

### **Quiz: More Than One Vertical Asymptote**

Take a quiz to check your understanding of what you have learned.

Duration: 0 hrs 20 mins Scoring: 20 points

### **Journal: Rural Wireless Internet**

Formulate and evaluate an approach to increasing rural internet access, and discuss conclusions with a peer.

Duration: 0 hrs 30 mins Scoring: 20 points

## **LESSON 9: GRAPHING RATIONAL FUNCTIONS**

### **Study: Graphing Rational Functions**

Learn about graphing rational functions with variables in the numerator, constructing a sign chart, and picking test numbers. Learn about rational functions with a singular point.

Duration: 0 hrs 35 mins Scoring: 0 points

### **Checkpoint: Practice Problems**

Complete a set of practice problems to check your understanding of the lesson.

Duration: 0 hrs 25 mins Scoring: 0 points

### **Quiz: Graphing Rational Functions**

Take a quiz to check your understanding of what you have learned.

Duration: 0 hrs 20 mins Scoring: 20 points

## **LESSON 10: RATIONAL EXPRESSIONS AND FUNCTIONS WRAP-UP**

### **Checkpoint: Assignment**

Submit your work for a set of 20 practice problems.

Duration: 0 hrs 25 mins Scoring: 0 points

### **Review: Rational Expressions and Functions**

Get ready for the unit test by reviewing important ideas and skills.

Duration: 0 hrs 20 mins Scoring: 0 points

### **Test (CS): Rational Expressions and Functions**

Take a computer-scored test to check what you have learned in this unit.

Duration: 0 hrs 40 mins Scoring: 50 points

### **Test (TS): Rational Expressions and Functions**

Take a teacher-scored test to check what you have learned in this unit.

Duration: 0 hrs 30 mins Scoring: 50 points

## **UNIT 6: SEMESTER 1 EXAM**

### **LESSON 1: SEMESTER 1 EXAM**

#### **Review: Semester 1**

Get ready for the semester exam by reviewing important ideas and skills.

Duration: 0 hrs 30 mins Scoring: 0 points

#### **Exam: Semester 1**

Take a computer-scored exam to demonstrate your mastery of concepts and skills covered in this semester.

Duration: 0 hrs 50 mins Scoring: 200 points

## **UNIT 7: RADICAL EXPRESSIONS AND FUNCTIONS**

### **LESSON 1: BASICS OF RADICALS**

#### **Study: Basics of Radicals**

Learn the definition of radical expression. Explore simplifying the product and quotient of radicals and simplifying individual radicals.

Duration: 0 hrs 35 mins Scoring: 0 points

### **Checkpoint: Practice Problems**

Complete a set of practice problems to check your understanding of the lesson.

Duration: 0 hrs 25 mins Scoring: 0 points

### **Quiz: Simplifying Products of Radicals**

Take a quiz to check your understanding of what you have learned.

Duration: 0 hrs 20 mins Scoring: 20 points

### **Quiz: Simplifying Quotients of Radicals**

Take a quiz to check your understanding of what you have learned.

Duration: 0 hrs 20 mins Scoring: 20 points

## **LESSON 2: MULTIPLYING AND DIVIDING RADICALS**

### **Study: Multiplying and Dividing Radicals**

Learn about multiplying and dividing radical expressions that include variables and about using the FOIL (first inner outer last) method to simplify radical expressions.

Duration: 0 hrs 35 mins Scoring: 0 points

### **Checkpoint: Practice Problems**

Complete a set of practice problems to check your understanding of the lesson.

Duration: 0 hrs 25 mins Scoring: 0 points

### **Quiz: Multiplying Radicals**

Take a quiz to check your understanding of what you have learned.

Duration: 0 hrs 20 mins Scoring: 20 points

### **Quiz: Dividing Radicals**

Take a quiz to check your understanding of what you have learned.

Duration: 0 hrs 20 mins Scoring: 20 points

## **LESSON 3: ADDING AND SUBTRACTING RADICALS**

### **Study: Adding and Subtracting Radicals**

Learn about adding and subtracting radical expressions by combining like terms and about simplifying terms to get the same radicand.

Duration: 0 hrs 35 mins Scoring: 0 points

### **Checkpoint: Practice Problems**

Complete a set of practice problems to check your understanding of the lesson.

Duration: 0 hrs 25 mins Scoring: 0 points

### **Quiz: Adding and Subtracting Radicals**

Take a quiz to check your understanding of what you have learned.

Duration: 0 hrs 20 mins Scoring: 20 points

## **LESSON 4: RATIONALIZING DENOMINATORS**

### **Study: Rationalizing Denominators**

Learn about rationalizing a denominator in order to simplify a fraction with a radical expression in the denominator. Learn about multiplying by the conjugate of a denominator.

Duration: 0 hrs 35 mins Scoring: 0 points

### **Checkpoint: Practice Problems**

Complete a set of practice problems to check your understanding of the lesson.

Duration: 0 hrs 25 mins Scoring: 0 points

### **Quiz: Rationalizing Denominators**

Take a quiz to check your understanding of what you have learned.

Duration: 0 hrs 20 mins Scoring: 20 points

### **Journal: Rationalizing Denominators**

Discuss rationalizing denominators with a peer.

Duration: 0 hrs 30 mins Scoring: 20 points

## **LESSON 5: SOLVING RADICAL FUNCTIONS**

### **Study: Solving Radical Functions**

Learn how to solve equations with radical expressions by isolating the radical and squaring both sides.

Duration: 0 hrs 35 mins Scoring: 0 points

### **Checkup: Practice Problems**

Complete a set of practice problems to check your understanding of the lesson.

Duration: 0 hrs 25 mins Scoring: 0 points

### **Quiz: Solving Radical Functions**

Take a quiz to check your understanding of what you have learned.

Duration: 0 hrs 20 mins Scoring: 20 points

## **LESSON 6: APPLICATIONS OF RADICAL EQUATIONS**

### **Study: Applications of Radical Equations**

Explore case studies in order to practice methods of solving radical equations in applied settings.

Duration: 0 hrs 35 mins Scoring: 0 points

### **Checkup: Practice Problems**

Check your understanding of the lesson.

Duration: 0 hrs 25 mins Scoring: 0 points

### **Quiz: Applications of Radical Equations**

Take a quiz to check your understanding of what you have learned.

Duration: 0 hrs 20 mins Scoring: 20 points

### **Practice: Pendulums and Bridges**

Create an equation to model pendulums and bridges.

Duration: 0 hrs 30 mins Scoring: 20 points

## **LESSON 7: RATIONAL EXPONENTS**

### **Study: Rational Exponents**

Learn about fractional exponents and  $n$ th roots, odd and even indices of radicals, the method of notation for writing an  $n$ th root, the use of fractional exponents, and exponential expressions with decimal powers.

Duration: 0 hrs 35 mins Scoring: 0 points

### **Checkup: Practice Problems**

Complete a set of practice problems to check your understanding of the lesson.

Duration: 0 hrs 25 mins Scoring: 0 points

### **Quiz: Fractional Exponents — Part 1**

Take a quiz to check your understanding of what you have learned.

Duration: 0 hrs 20 mins Scoring: 20 points

### **Quiz: Fractional Exponents — Part 2**

Take a quiz to check your understanding of what you have learned.

Duration: 0 hrs 20 mins Scoring: 20 points

## **LESSON 8: REVIEW OF COMPLEX NUMBERS**

### **Study: Review of Complex Numbers**

Learn about square roots of negative numbers; imaginary units; parts of a complex number; adding and subtracting complex numbers by collecting like terms and simplifying; multiplying two complex numbers using the FOIL method; and dividing complex numbers using complex conjugates.

Duration: 0 hrs 35 mins Scoring: 0 points



**Checkpoint: Practice Problems**

Complete a set of practice problems to check your understanding of the lesson.

Duration: 0 hrs 25 mins Scoring: 0 points

**Quiz: Adding and Subtracting Complex Numbers**

Take a quiz to check your understanding of what you have learned.

Duration: 0 hrs 20 mins Scoring: 20 points

**Quiz: Multiplying and Dividing Complex Numbers**

Take a quiz to check your understanding of what you have learned.

Duration: 0 hrs 20 mins Scoring: 20 points

**LESSON 9: PERFORMANCE TASK: THE SKID DISTANCE PROBLEM****Study: The Skid Distance Problem**

Learn how the length of skid marks left by a vehicle is an application of square root functions. Use the skid distance equation to solve for drag factor of various road surfaces, as well as skid mark lengths and original speed of a variety of vehicles.

Duration: 0 hrs 35 mins Scoring: 0 points

**Project: Solving the Skid Distance Problem**

Assume the role of investigator and take on a skid distance problem.

Duration: 2 hrs Scoring: 120 points

**LESSON 10: RADICAL EXPRESSIONS AND FUNCTIONS WRAP-UP****Checkpoint: Assignment**

Submit your work for a set of 20 practice problems.

Duration: 0 hrs 25 mins Scoring: 0 points

**Review: Radical Expressions and Functions**

Get ready for the unit test by reviewing important ideas and skills.

Duration: 0 hrs 20 mins Scoring: 0 points

**Test (CS): Radical Expressions and Functions**

Take a computer-scored test to check what you have learned in this unit.

Duration: 0 hrs 40 mins Scoring: 50 points

**Test (TS): Radical Expressions and Functions**

Take a teacher-scored test to check what you have learned in this unit.

Duration: 0 hrs 30 mins Scoring: 50 points

**UNIT 8: EXPONENTIAL AND LOGARITHMIC FUNCTIONS****LESSON 1: GEOMETRIC SEQUENCES****Study: Geometric Sequences**

Learn about geometric sequences and series.

Duration: 0 hrs 35 mins

**Checkpoint: Practice Problems**

Complete a set of practice problems on geometric sequences.

Duration: 0 hrs 25 mins

**Quiz: Geometric Sequences**

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 20 mins Scoring: 20 points

**Practice: Modeling: Viral Videos**

Model the growth of a viral video using geometric sequences.

Duration: 0 hrs 30 mins Scoring: 20 points

## LESSON 2: EXPONENTIAL FUNCTIONS

### Study: Exponential Functions

Define the standard form of an exponential function and explore a variety of its applications, such as exponential growth and decay (in the forms of doubling time and half-life), as well as compound interest. Compare compound interest to continuously compounded interest using the irrational number  $e$ .

Duration: 0 hrs 35 mins Scoring: 0 points

### Checkpoint: Practice Problems

Complete a set of practice problems to check your understanding of the lesson.

Duration: 0 hrs 25 mins Scoring: 0 points

### Quiz: Evaluating Exponential Functions

Take a quiz to check your understanding of what you have learned.

Duration: 0 hrs 20 mins Scoring: 20 points

### Quiz: Calculating Exponential Growth

Take a quiz to check your understanding of what you have learned.

Duration: 0 hrs 20 mins Scoring: 20 points

## LESSON 3: EXAMPLES AND APPLICATIONS OF EXPONENTIAL FUNCTIONS

### Study: Examples and Applications of Exponential Functions

Explore case studies in exponential growth and decay and logarithmic growth.

Duration: 0 hrs 35 mins Scoring: 0 points

### Checkpoint: Practice Problems

Check your understanding of the lesson.

Duration: 0 hrs 25 mins Scoring: 0 points

## LESSON 4: GRAPHS OF EXPONENTIAL FUNCTIONS

### Study: Graphs of Exponential Functions

Learn about the shape of graphs of exponential functions with various bases and about finding the domain and range of exponential functions.

Duration: 0 hrs 35 mins Scoring: 0 points

### Checkpoint: Practice Problems

Complete a set of practice problems to check your understanding of the lesson.

Duration: 0 hrs 25 mins Scoring: 0 points

### Quiz: Graphs of Exponential Functions

Take a quiz to check your understanding of what you have learned.

Duration: 0 hrs 20 mins Scoring: 20 points

### Journal: Exponential vs. Quadratic

Interpret a table of cell growth data, and discuss with a peer.

Duration: 0 hrs 30 mins Scoring: 20 points

## LESSON 5: LOGARITHMIC FUNCTIONS

### Study: Logarithmic Functions

Learn about undoing exponential functions, graphing the inverse of an exponential or logarithmic function, and using the common and natural logarithm.

Duration: 0 hrs 35 mins Scoring: 0 points

### Checkpoint: Practice Problems

Complete a set of practice problems to check your understanding of the lesson.

Duration: 0 hrs 25 mins Scoring: 0 points

### Quiz: Logarithmic Functions

Take a quiz to check your understanding of what you have learned.

## LESSON 6: GRAPHS OF LOGARITHMIC FUNCTIONS

### Study: Graphs of Logarithmic Functions

Learn about the shape of graphs of logarithmic functions with various bases and about the domain and range of logarithmic functions.

Duration: 0 hrs 35 mins Scoring: 0 points

### Checkpoint: Practice Problems

Complete a set of practice problems to check your understanding of the lesson.

Duration: 0 hrs 25 mins Scoring: 0 points

### Quiz: Graphs of Logarithmic Functions

Take a quiz to check your understanding of what you have learned.

Duration: 0 hrs 20 mins Scoring: 20 points

## LESSON 7: PROPERTIES OF EXPONENTS AND LOGARITHMS

### Study: Properties of Exponents and Logarithms

Learn about product, quotient, and power laws of exponents; rewriting the log of a product as the sum of two logs; rewriting the log of a quotient as the difference of two logs; simplifying the log of a power; and using the change-of-base formula to rewrite logarithms.

Duration: 0 hrs 35 mins Scoring: 0 points

### Checkpoint: Practice Problems

Complete a set of practice problems to check your understanding of the lesson.

Duration: 0 hrs 25 mins Scoring: 0 points

### Quiz: Equivalent Exponential Expressions

Take a quiz to check your understanding of what you have learned.

Duration: 0 hrs 20 mins Scoring: 20 points

### Quiz: Equivalent Logarithmic Expressions

Take a quiz to check your understanding of what you have learned.

Duration: 0 hrs 20 mins Scoring: 20 points

### Quiz: Evaluating Logarithms

Take a quiz to check your understanding of what you have learned.

Duration: 0 hrs 20 mins Scoring: 20 points

## LESSON 8: SOLVING EXPONENTIAL EQUATIONS

### Study: Solving Exponential Equations

Learn about using ordinary algebra and the properties of logarithms to solve exponential equations. Answer questions inspired by the classic chessboard problem.

Duration: 0 hrs 35 mins Scoring: 0 points

### Checkpoint: Practice Problems

Complete a set of practice problems to check your understanding of the lesson.

Duration: 0 hrs 25 mins Scoring: 0 points

### Quiz: Solving Exponential Equations

Take a quiz to check your understanding of what you have learned.

Duration: 0 hrs 20 mins Scoring: 20 points

## LESSON 9: SOLVING LOGARITHMIC EQUATIONS

### Study: Solving Logarithmic Equations

Learn about using ordinary algebra and the definition of a logarithm to solve logarithmic equations. Answer questions about energy in earthquakes.

Duration: 0 hrs 35 mins Scoring: 0 points

**Checkpoint: Practice Problems**

Complete a set of practice problems to check your understanding of the lesson.

Duration: 0 hrs 25 mins Scoring: 0 points

**Quiz: Solving Logarithmic Equations**

Take a quiz to check your understanding of what you have learned.

Duration: 0 hrs 20 mins Scoring: 20 points

**LESSON 10: APPLICATIONS OF LOGARITHMS****Study: Applications of Logarithms**

Solve application problems involving exponential and logarithmic expressions.

Duration: 0 hrs 35 mins

**Checkpoint: Practice Problems**

Complete a set of practice problems on applications of logarithms.

Duration: 0 hrs 25 mins

**Quiz: Applications of Logarithms**

Take a quiz to check your understanding of what you have learned.

Duration: 0 hrs 20 mins Scoring: 20 points

**LESSON 11: COMPARING AND ANALYZING FUNCTION TYPES****Study: Comparing and Analyzing Function Types**

Apply transformations to a variety of function families.

Duration: 0 hrs 35 mins Scoring: 0 points

**Checkpoint: Practice Problems**

Check your understanding of the lesson.

Duration: 0 hrs 25 mins Scoring: 0 points

**Quiz: Comparing and Analyzing Function Types**

Take a quiz to check your understanding of what you have learned.

Duration: 0 hrs 20 mins Scoring: 20 points

**LESSON 12: EXPONENTIAL AND LOGARITHMIC FUNCTIONS WRAP-UP****Checkpoint: Assignment**

Submit your work for a set of 20 practice problems.

Duration: 0 hrs 25 mins

**Review: Exponential and Logarithmic Functions**

Get ready for the unit test by reviewing important ideas and skills.

Duration: 0 hrs 20 mins Scoring: 0 points

**Test (CS): Exponential and Logarithmic Functions**

Take a computer-scored test to check what you have learned in this unit.

Duration: 0 hrs 40 mins Scoring: 50 points

**Test (TS): Exponential and Logarithmic Functions**

Take a teacher-scored test to check what you have learned in this unit.

Duration: 0 hrs 30 mins Scoring: 50 points

**UNIT 9: RIGHT TRIANGLES AND TRIGONOMETRY****LESSON 1: THE PYTHAGOREAN THEOREM****Study: The Pythagorean Theorem**

Learn how the Pythagorean theorem applies only to right triangles and discover one proof of it. Learn about the converse of the Pythagorean theorem, Pythagorean triples, and applying the theorem to the problem of fitting a baseball bat into a rectangular trunk.

Duration: 0 hrs 35 mins Scoring: 0 points

**Checkpoint: Practice Problems**

Check your understanding of the lesson.

Duration: 0 hrs 25 mins Scoring: 0 points

**Quiz: The Pythagorean Theorem**

Take a quiz to check your understanding of what you have learned.

Duration: 0 hrs 20 mins Scoring: 20 points

**LESSON 2: PROVING CONGRUENCE OF RIGHT TRIANGLES****Study: Proving Congruence of Right Triangles**

Learn about the HL, LL, HA, LA, and perpendicular bisector theorems. Learn about the angle bisector theorem and its converse.

Duration: 0 hrs 35 mins Scoring: 0 points

**Checkpoint: Practice Problems**

Check your understanding of the lesson.

Duration: 0 hrs 25 mins Scoring: 0 points

**Quiz: Proving Right Triangle Congruence**

Take a quiz to check your understanding of what you have learned.

Duration: 0 hrs 20 mins Scoring: 20 points

**Quiz: Right Triangle Measurements**

Take a quiz to check your understanding of what you have learned.

Duration: 0 hrs 20 mins Scoring: 20 points

**LESSON 3: SIMILAR RIGHT TRIANGLES****Study: Similar Right Triangles**

Explore the properties of similar right triangles. Prove that if an altitude is drawn from the right-angle vertex of a right triangle to its hypotenuse, then three similar triangles are formed. Calculate the missing sides of similar right triangles by using proportions and apply concepts learned to a miniature-golf problem.

Duration: 0 hrs 35 mins Scoring: 0 points

**Checkpoint: Practice Problems**

Check your understanding of the lesson.

Duration: 0 hrs 25 mins Scoring: 0 points

**Quiz: Similar Right Triangles**

Take a quiz to check your understanding of what you have learned.

Duration: 0 hrs 20 mins Scoring: 20 points

**LESSON 4: SPECIAL RIGHT TRIANGLES****Study: Special Right Triangles**

Explore 45-45-90 and 30-60-90 triangles as special cases of right triangles and learn how to apply the ratios of their side lengths.

Duration: 0 hrs 35 mins Scoring: 0 points

**Checkpoint: Practice Problems**

Check your understanding of the lesson.

Duration: 0 hrs 25 mins Scoring: 0 points

**Quiz: 45-45-90 Right Triangles**

Take a quiz to check your understanding of what you have learned.

Duration: 0 hrs 20 mins Scoring: 20 points

**Quiz: 30-60-90 Right Triangles**

Take a quiz to check your understanding of what you have learned.

Duration: 0 hrs 20 mins Scoring: 20 points

## LESSON 5: TRIGONOMETRIC RATIOS

### Study: Trigonometric Ratios

Learn the definitions of *sine*, *cosine*, and *tangent*. Memorize the shortcut "soh-cah-toa" as a way to relate these ratios. Explore the use of trigonometric ratios in the solution of a real-world problem involving the construction of a cable car.

Duration: 0 hrs 35 mins Scoring: 0 points

### Checkpoint: Practice Problems

Check your understanding of the lesson.

Duration: 0 hrs 25 mins Scoring: 0 points

### Quiz: Trigonometric Ratios

Take a quiz to check your understanding of what you have learned.

Duration: 0 hrs 20 mins Scoring: 20 points

### Practice: Modeling: Leaning Towers

Use your knowledge of right triangles, trigonometric ratios, and the Pythagorean Theorem to model and solve a real-world problem.

Duration: 0 hrs 30 mins Scoring: 20 points

## LESSON 6: AREA OF A TRIANGLE WITH COORDINATE GEOMETRY

### Study: Area of a Triangle with Coordinate Geometry

Learn about the area of a polygon, square units, and the triangle area formula and theorem.

Duration: 0 hrs 35 mins Scoring: 0 points

### Checkpoint: Practice Problems

Check your understanding of the lesson.

Duration: 0 hrs 25 mins Scoring: 0 points

### Quiz: Area of a Triangle

Take a quiz to check your understanding of what you have learned.

Duration: 0 hrs 20 mins Scoring: 20 points

## LESSON 7: LAW OF COSINES AND PROOFS

### Study: Law of Cosines and Proofs

Use the law of cosines to solve triangles.

Duration: 0 hrs 35 mins

### Checkpoint: Practice Problems

Complete a set of practice problems using the law of cosines.

Duration: 0 hrs 25 mins

### Quiz: Law of Cosines and Proofs

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 20 mins Scoring: 20 points

## LESSON 8: LAW OF SINES AND PROOFS

### Study: Law of Sines and Proofs

Use the law of sines to solve triangles and to explore the ambiguous case.

Duration: 0 hrs 35 mins

### Checkpoint: Practice Problems

Complete a set of practice problems using the law of sines.

Duration: 0 hrs 25 mins

### Quiz: Law of Sines and Proofs

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 20 mins Scoring: 20 points

### Journal: Law of Sines and Proofs

Use what you know about triangles and trigonometric ratios to prove the law of sines.

Duration: 0 hrs 30 mins Scoring: 20 points

## LESSON 9: RIGHT TRIANGLES AND TRIGONOMETRY WRAP-UP

### Checkpoint: Right Triangles and Trigonometry Practice Problems

Check your understanding of the topics in this unit.

Duration: 0 hrs 25 mins Scoring: 0 points

### Review: Right Triangles and Trigonometry

Get ready for the unit test by reviewing important ideas and skills.

Duration: 0 hrs 30 mins Scoring: 0 points

### Test (CS): Right Triangles and Trigonometry

Take a computer-scored test to check what you have learned in this unit.

Duration: 0 hrs 40 mins Scoring: 50 points

### Test (TS): Right Triangles and Trigonometry

Take a teacher-scored test to assess what you have learned in this unit.

Duration: 0 hrs 30 mins Scoring: 50 points

## UNIT 10: TRIGONOMETRY

### LESSON 1: RIGHT TRIANGLE TRIGONOMETRY

#### Study: Right Triangle Trigonometry

Review right triangles and get an introduction to trigonometric ratios.

Duration: 0 hrs 35 mins

#### Checkpoint: Practice Problems

Complete a set of practice problems on trigonometry.

Duration: 0 hrs 25 mins

#### Quiz: Introduction to Trigonometry

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 20 mins Scoring: 20 points

### LESSON 2: ANGLES AND RADIANs

#### Study: Angles and Radians

Learn about angles expressed in degrees and radians.

Duration: 0 hrs 35 mins

#### Checkpoint: Practice Problems

Complete a set of practice problems on angles and radians.

Duration: 0 hrs 25 mins

#### Quiz: Angles and Radians

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 20 mins Scoring: 20 points

### LESSON 3: TRIGONOMETRIC RATIOS AND THE UNIT CIRCLE

#### Study: Trigonometric Ratios and the Unit Circle

Learn the six trigonometric ratios and how the unit circle defines them.

Duration: 0 hrs 35 mins

#### Study: Pythagorean Theorem

Review the Pythagorean theorem.

Duration: 0 hrs 35 mins

#### Checkpoint: Practice Problems

Complete a set of practice problems on trigonometric functions and the unit circle.

Duration: 0 hrs 25 mins

### **Quiz: Trigonometric Functions and the Unit Circle**

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 20 mins Scoring: 20 points

### **Journal: A Better Way?**

Discuss a trigonometric "shortcut", and explain when it will and will not work.

Duration: 0 hrs 30 mins Scoring: 20 points

## **LESSON 4: GRAPHS OF SINE AND COSINE**

### **Study: Graphs of Sine and Cosine**

Learn to build the graphs of sine and cosine.

Duration: 0 hrs 35 mins

### **Checkup: Practice Problems**

Complete a set of practice problems on graphs of sine and cosine.

Duration: 0 hrs 25 mins

### **Quiz: Graphs of Sine and Cosine**

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 20 mins Scoring: 20 points

## **LESSON 5: GRAPHS OF OTHER FUNCTIONS**

### **Study: Graphs of Other Functions**

Learn the graphs of the other four trigonometric functions.

Duration: 0 hrs 35 mins

### **Checkup: Practice Problems**

Complete a set of practice problems on graphs of other functions.

Duration: 0 hrs 25 mins

### **Quiz: Graphs of Other Functions**

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 20 mins Scoring: 20 points

## **LESSON 6: SIMPLE TRANSFORMATIONS OF SINUSOIDS**

### **Study: Simple Transformations of Sinusoids**

Learn how to transform trigonometric graphs with reflections, shifts, and stretches.

Duration: 0 hrs 35 mins

### **Checkup: Practice Problems**

Complete a set of practice problems on transformations of periodic graphs.

Duration: 0 hrs 25 mins

### **Quiz: Simple Transformations of Sinusoids**

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 20 mins Scoring: 20 points

## **LESSON 7: GENERAL T TRANSFORMATIONS OF PERIODIC GRAPHS**

### **Study: General T Transformations of Periodic Graphs**

Learn how to transform trigonometric graphs with reflections, shifts, and stretches.

Duration: 0 hrs 35 mins

### **Checkup: Practice Problems**

Complete a set of practice problems on transformations of trigonometric functions.

Duration: 0 hrs 25 mins

### **Quiz: General Transformations of Periodic Graphs**



Take a quiz to assess your understanding of the material.

Duration: 0 hrs 20 mins Scoring: 20 points

### **Practice: Modeling: Riding the Circular Wave**

Model real world data using a periodic function.

Duration: 0 hrs 30 mins Scoring: 20 points

## **LESSON 8: IDENTITIES AND PROOF**

### **Study: Identities and Proof**

Learn how to prove identities.

Duration: 0 hrs 35 mins

### **Checkup: Practice Problems**

Complete a set of practice problems on identities and proof.

Duration: 0 hrs 25 mins

### **Quiz: Identities and Proof**

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 20 mins Scoring: 20 points

## **LESSON 9: TRIGONOMETRIC IDENTITIES**

### **Study: Trigonometric Identities**

Learn the key trigonometric identities.

Duration: 0 hrs 35 mins

### **Checkup: Lessons Learned**

Complete a set of practice problems on trigonometric identities.

Duration: 0 hrs 25 mins

### **Quiz: Trigonometric Identities**

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 20 mins Scoring: 20 points

## **LESSON 10: TRIGONOMETRY WRAP-UP**

### **Checkup: Practice Problems**

Check your understanding of the unit.

Duration: 0 hrs 25 mins Scoring: 0 points

### **Review: Trigonometry**

Get ready for the unit test by reviewing important ideas and skills.

Duration: 0 hrs 20 mins Scoring: 0 points

### **Test (CS): Trigonometry**

Take a computer-scored test to check what you have learned in this unit.

Duration: 0 hrs 40 mins Scoring: 50 points

### **Test (TS): Trigonometry**

Take a teacher-scored test to check what you have learned in this unit.

Duration: 0 hrs 30 mins Scoring: 50 points

## **UNIT 11: THREE-DIMENSIONAL SOLIDS**

### **LESSON 1: THREE DIMENSIONS**

#### **Study: Three Dimensions**

Learn about measuring three-dimensional figures.

Duration: 0 hrs 35 mins Scoring: 0 points

#### **Quiz: Three Dimensions**

Take a quiz to check your understanding of what you have learned.

Duration: 0 hrs 20 mins Scoring: 20 points

## LESSON 2: WHAT IS A POLYHEDRON?

### Study: What Is a Polyhedron?

Learn about the definition and elements of a polyhedron, prisms and their components, triangular and rectangular prisms, cubes, and regular and irregular pyramids.

Duration: 0 hrs 35 mins Scoring: 0 points

### Quiz: What Is a Polyhedron?

Take a quiz to check your understanding of what you have learned.

Duration: 0 hrs 20 mins Scoring: 20 points

## LESSON 3: CYLINDERS AND CONES

### Study: Cylinders and Cones

Learn about the definition, components, and properties of a cylinder; the definition and components of a cone; and the similarities between cones and pyramids.

Duration: 0 hrs 35 mins Scoring: 0 points

### Quiz: Cylinders and Cones

Take a quiz to check your understanding of what you have learned.

Duration: 0 hrs 20 mins Scoring: 20 points

## LESSON 4: PLATONIC SOLIDS

### Study: Platonic Solids

Learn about polygonal numbers, regularity of Platonic solids, and building your own Platonic solids.

Duration: 0 hrs 35 mins Scoring: 0 points

### Quiz: Platonic Solids

Take a quiz to check your understanding of what you have learned.

Duration: 0 hrs 20 mins Scoring: 20 points

### Practice: Modeling: Solids

Practice with a real-world solid modeling application.

Duration: 0 hrs 30 mins Scoring: 20 points

## LESSON 5: SURFACE AREA

### Study: Surface Area

Learn about perimeter and surface area; base and lateral area; slant height versus altitude; and the formulas for surface area of a right prism, an oblique prism, a regular pyramid, an oblique cylinder, a right cone, and an oblique cone. Explore sample problems dealing with these subjects.

Duration: 0 hrs 35 mins Scoring: 0 points

### Checkup: Practice Problems

Check your understanding of the lesson.

Duration: 0 hrs 25 mins Scoring: 0 points

### Quiz: Surface Area of Regular Prisms and Pyramids

Take a quiz to check your understanding of what you have learned.

Duration: 0 hrs 20 mins Scoring: 20 points

### Quiz: Surface Area of Right Cylinders and Cones

Take a quiz to check your understanding of what you have learned.

Duration: 0 hrs 20 mins Scoring: 20 points

## LESSON 6: VOLUME

### Study: Volume

Learn about area and volume, the formulas for volume of a cube and a rectangular prism, and Bonaventura Francesco Cavalieri's principle. Learn about the formulas for volume of a cylinder, a pyramid, and a cone; explore sample problems

dealing with these formulas. Learn about cross-sectional area.

Duration: 0 hrs 35 mins Scoring: 0 points

### **Checkpoint: Practice Problems**

Check your understanding of the lesson.

Duration: 0 hrs 25 mins Scoring: 0 points

### **Quiz: Volume of Prisms, Cylinders, and Cubes**

Take a quiz to check your understanding of what you have learned.

Duration: 0 hrs 20 mins Scoring: 20 points

### **Quiz: Volume of Cones, Cylinders, and Pyramids**

Take a quiz to check your understanding of what you have learned.

Duration: 0 hrs 20 mins Scoring: 20 points

### **Journal: Volume**

Think about and discuss how changing one dimension of a given shape changes its volume and surface area.

Duration: 0 hrs 30 mins Scoring: 20 points

## **LESSON 7: SPHERES**

### **Study: Spheres**

Learn about the definition of a sphere; the formulas for surface area and volume of a sphere; comparing the surface area and volume of a sphere, cube, cylinder, and cone; and using Cavalieri's principle to derive the formula for volume of a sphere.

Duration: 0 hrs 35 mins Scoring: 0 points

### **Checkpoint: Practice Problems**

Check your understanding of the lesson.

Duration: 0 hrs 25 mins Scoring: 0 points

### **Quiz: Spheres**

Take a quiz to check your understanding of what you have learned.

Duration: 0 hrs 20 mins Scoring: 20 points

## **LESSON 8: SIMILAR SOLIDS**

### **Study: Similar Solids**

Learn about similar prisms, pyramids, cylinders, cones, and spheres; the constant ratio between corresponding parts of similar solids; and the ratio of volumes of similar solids.

Duration: 0 hrs 35 mins Scoring: 0 points

### **Checkpoint: Practice Problems**

Check your understanding of the lesson.

Duration: 0 hrs 25 mins Scoring: 0 points

### **Quiz: Similar Solids**

Take a quiz to check your understanding of what you have learned.

Duration: 0 hrs 20 mins Scoring: 20 points

## **LESSON 9: THREE-DIMENSIONAL SOLIDS WRAP-UP**

### **Checkpoint: Three-Dimensional Solids Practice Problems**

Check your understanding of the topics in this unit.

Duration: 0 hrs 25 mins Scoring: 0 points

### **Review: Three-Dimensional Solids**

Get ready for the unit test by reviewing important ideas and skills.

Duration: 0 hrs 30 mins Scoring: 0 points

### **Test (CS): Three-Dimensional Solids**

Take a computer-scored test to check what you have learned in this unit.

Duration: 0 hrs 40 mins Scoring: 32 points

### **Test (TS): Three-Dimensional Solids**

Take a teacher-scored test to check what you have learned in this unit.

Duration: 0 hrs 30 mins Scoring: 50 points

## **UNIT 12: SEMESTER 2 EXAM**

### **LESSON 1: SEMESTER 2 EXAM**

#### **Review: Semester 2**

Get ready for the semester exam by reviewing important ideas and skills.

Duration: 0 hrs 20 mins Scoring: 0 points

#### **Exam: Semester 2**

Take a computer-scored exam to demonstrate your mastery of concepts and skills covered in this semester.

Duration: 0 hrs 50 mins Scoring: 200 points