



DREYFOUS & ASSOCIATES

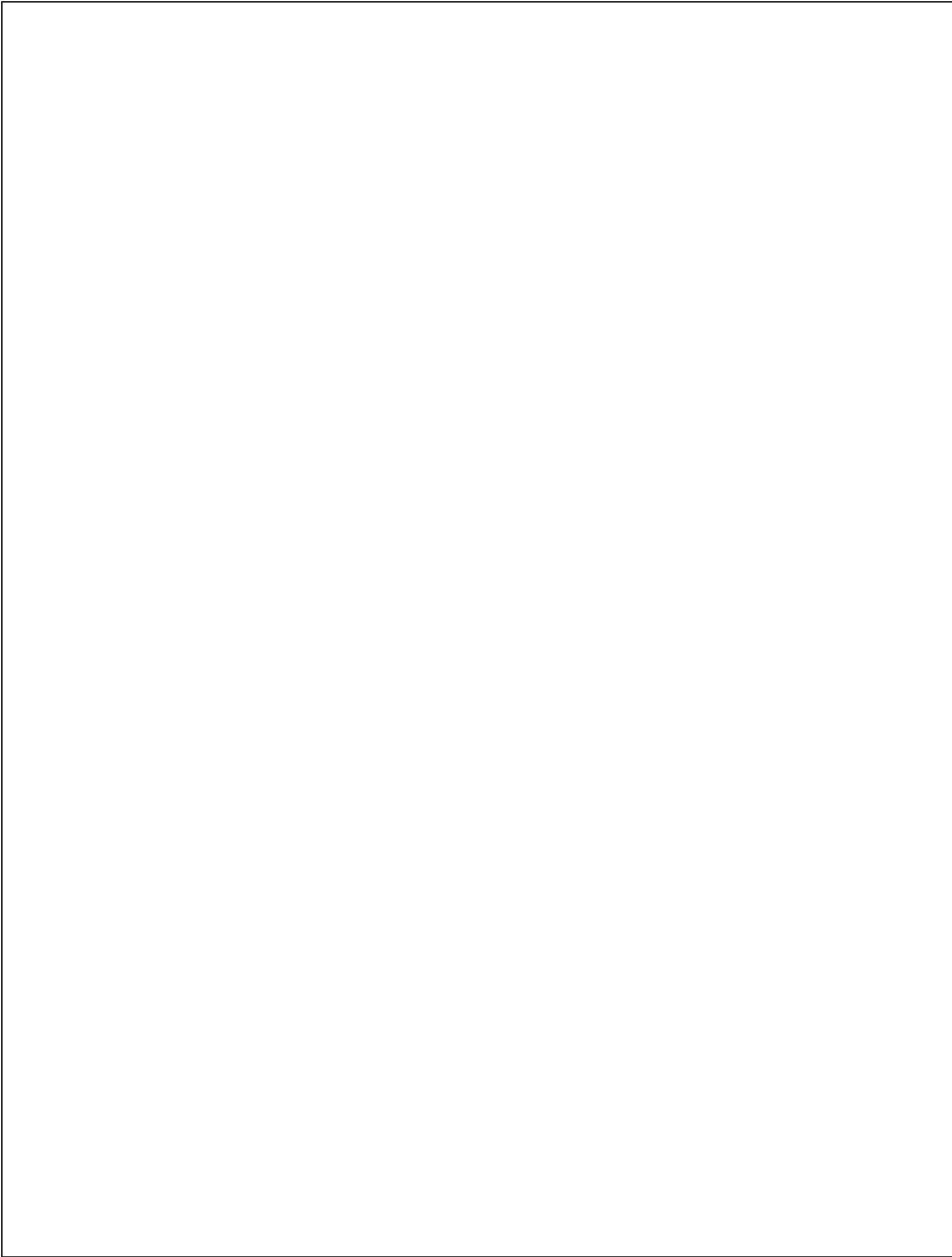
Course Overview

Algebra II



TABLE OF CONTENTS

Breakdown of Units.....	1
Unit 0. Preparing for Advanced Algebra	1
Unit 1. Equations and Inequalities	3
Unit 2. Linear Relations and Functions	5
Unit 3. Systems of Equations and Inequalities.....	8
Unit 4. Matrices.....	10
Unit 5. Quadratic Functions and Relations	12
Unit 6. Polynomials and Polynomial Functions.....	15
Unit 7. Inverses and Radical Functions and Relations	18
Unit 8. Exponential and Logarithmic Functions and Relations	20
Unit 9. Rational Functions and Relations	23
Unit 10. Conic Sections.....	25
Unit 11. Sequences and Series	27
Unit 12. Probability and Statistics	30
Unit 13. Trigonometric Functions	33
Unit 14. Trigonometric Identities and Equations.....	36



Breakdown of Units

Below is an itemization of the division of each unit in lessons, including a detailed description of the general objectives and the name of each lesson with its corresponding objectives, concepts, and skills.

Unit 0. Preparing for Advanced Algebra

At the end of this unit the student will have completed the objectives found in the following lessons.

Lesson 0. Preparing for Advanced Algebra

Code: C304G0SU00L00

Unit Documents: Pretest and Posttest.

Lesson 1. Representing Functions

Code: C304G0SU00L01

Objective

- Identify the domain and range of functions.

Lesson 2. FOIL

Code: C304G0SU00L02

Objective

- Use the FOIL method to multiply binomials.

Lesson 3. Factoring Polynomials

Code: C304G0SU00L03

Objective

- Use various techniques to factor polynomials.

Lesson 4. The Counting Principle

Code: C304G0SU00L04

Objective

- Use the fundamental Counting Principle to find outcomes involving independent and dependent events.

Lesson 5. Permutations and Combinations

Code: C304G0SU00L05

Objective

- Solve problems involving permutations and combinations.

Lesson 6. Congruent and Similar Figures**Code:** C304G0SU00L06**Objective**

- Identify and use congruent and similar figures.

Lesson 7. The Pythagorean Theorem**Code:** C304G0SU00L07**Objective**

- Use the Pythagorean Theorem and its converse.

Unit 1. Equations and Inequalities

At the end of this unit the student will have completed the objectives found in the following lessons.

General Objectives

- Simplify and evaluate algebraic expressions.
- Solve linear and absolute value equations.
- Solve and graph inequalities.

Lesson 0. Equations and Inequalities

Code: C304G0SU01L00

Unit Documents: Lesson Review, Mid Unit Quiz, Practice Test, Preparing for Standardized Tests, Standardized Test Practice and Study Guide.

Lesson 1. Expressions and Formulas

Code: C304G0SU01L01

Objectives

- Use the order of operations to evaluate expressions.
- Use formulas.

Concepts

- algebraic expressions
- formula
- order of operations
- variables

Lesson 2. Properties of Real Numbers

Code: C304G0SU01L02

Objectives

- Classify real numbers.
- Use the properties of real numbers to evaluate expressions.

Concepts

- integers
- irrational numbers
- natural numbers
- rational numbers
- real numbers
- whole numbers

Lesson 3. Solving Equations

Code: C304G0SU01L03

Objectives

- Translate verbal expressions into algebraic expressions and equations, and vice versa.

- Solve equations using the properties of equality.

Concepts

- equation
- open sentence
- solution

Lesson 4. Solving Absolute Value Equations

Code: C304G0SU01L04

Objectives

- Evaluate expressions involving absolute values.
- Solve absolute value equations.

Concepts

- absolute value
- empty set
- extraneous solution

Lesson 5. Solving Inequalities

Code: C304G0SU01L05

Objectives

- Solve one-step inequalities.
- Solve multi-step inequalities.

Concept

- set-builder notation

Lesson 6. Solving Compound and Absolute Value Inequalities

Code: C304G0SU01L06

Objectives

- Solve compound inequalities.
- Solve absolute value inequalities.

Concepts

- compound inequality
- intersection
- union

Unit 2. Linear Relations and Functions

At the end of this unit the student will have completed the objectives found in the following lessons.

General Objectives

- Use equations of relations and functions.
- Determine the slope of a line.
- Use scatter plots and prediction equations.
- Graph linear inequalities.

Lesson 0. Linear Relations and Functions

Code: C304G0SU02L00

Unit Documents: Lesson Review, Mid Unit Quiz, Practice Test, Preparing for Standardized Tests, Standardized Test Practice and Study Guide.

Lesson 1. Relations and Functions

Code: C304G0SU02L01

Objectives

- Analyze relations and functions.
- Use equations of relations and functions.

Concepts

- dependent variable
- discrete relation
- function notation
- independent variable
- one-to-one function
- onto function
- vertical line test

Lesson 2. Linear Relations and Functions

Code: C304G0SU02L02

Objectives

- Identify linear relations and functions.
- Write linear equations in standard form.

Concepts

- linear equation
- linear function
- linear relation
- nonlinear relation
- standard form
- x -intercept
- y -intercept

Lesson 3. Rate of Change and Slope

Code: C304G0SU02L03

Objectives

- Find rate of change.
- Determine the slope of a line.

Concepts

- rate of change
- slope

Lesson 4. Write Linear Equations

Code: C304G0SU02L04

Objectives

- Write an equation of a line given the slope and a point on the line.
- Write an equation of a line parallel or perpendicular to a given line.

Concepts

- parallel
- perpendicular
- point-slope form
- slope-intercept form

Lesson 5. Scatter Plots and Lines of Regression

Code: C304G0SU02L05

Objectives

- Use scatter plots and prediction equations.
- Model data using lines of regression.

Concepts

- bivariate data
- correlation coefficient
- dot plot
- line of fit
- negative correlation
- positive correlation
- prediction equation
- regression line
- scatter plot

Lesson 6. Special Functions

Code: C304G0SU02L06

Objectives

- Write and graph piecewise-defined functions.
- Write and graph step and absolute value functions.

Concepts

- absolute value function

- greatest integer function
- piecewise-defined function
- piecewise-linear function
- step function

Lesson 7. Parent Functions and Transformations

Code: C304G12U02L07

Objectives

- Identify and use parent functions.
- Describe transformations of functions.

Concepts

- constant function
- dilation
- family of graphs
- identify function
- line of reflection
- parent function
- parent graph
- quadratic function
- reflection
- translation

Lesson 8. Graphing Linear and Absolute Value Inequalities

Code: C304G12U02L08

Objectives

- Graph linear inequalities.
- Graph absolute value inequalities.

Concepts

- boundary
- linear inequality

Unit 3. Systems of Equations and Inequalities

At the end of this unit the student will have completed the objectives found in the following lessons.

General Objectives

- Solve systems of linear equations graphically and algebraically.
- Solve systems of linear inequalities graphically.
- Solve problems by using linear programming.

Lesson 0. Systems of Equations and Inequalities

Code: C304G0SU03L00

Unit Documents: Lesson Review, Mid Unit Quiz, Practice Test, Preparing for Standardized Tests, Standardized Test Practice and Study Guide.

Lesson 1. Solving Systems of Equations by Graphing

Code: C304G0SU03L01

Objectives

- Solve systems of linear equations by using tables and graphs.
- Determine whether a system of linear equations is inconsistent, consistent and dependent, or consistent and independent.

Concepts

- break-even point
- consistent
- dependent
- inconsistent
- independent
- system of equations

Lesson 2. Solving Systems of Equations Algebraically

Code: C304G0SU03L02

Objectives

- Solve systems of linear equations by using substitution.
- Solve systems of linear equations by using elimination.

Concepts

- elimination method
- substitution method

Lesson 3. Solving Systems of Inequalities by Graphing

Code: C304G0SU03L03

Objectives

- Solve systems of inequalities by graphing.
- Determine the coordinates of the vertices of a region formed by the graph of a system of inequalities.

Concept

- system of inequalities

Lesson 4. Optimization with Linear Programming

Code: C304G0SU03L04

Objectives

- Find the maximum and minimum values of a function over a region.
- Solve real-world optimization problems using linear programming.

Concepts

- bounded
- constraints
- feasible region
- linear programming
- optimize
- unbounded

Lesson 5. Systems of Equations in Three Variables

Code: C304G0SU03L05

Objectives

- Solve systems of linear equations in three variables.
- Solve real-world problems using systems of linear equations in three variables.

Concept

- ordered triple

Unit 4. Matrices

At the end of this unit the student will have completed the objectives found in the following lessons.

General Objectives

- Organize data in matrices.
- Perform operations with matrices and determinants.
- Find inverses of matrices.
- Use matrices to solve systems of equations.

Lesson 0. Matrices

Code: C304G0SU04L00

Unit Documents: Lesson Review, Mid Unit Quiz, Practice Test, Preparing for Standardized Tests, Standardized Test Practice and Study Guide.

Lesson 1. Introduction to Matrices

Code: C304G0SU04L01

Objectives

- Organize data in matrices.
- Use matrix row and column operations to analyze data.

Concepts

- column matrix
- dimensions
- element
- equal matrices
- matrix
- row matrix
- square matrix
- zero matrix

Lesson 2. Operations with Matrices

Code: C304G0SU04L02

Objectives

- Add and subtract matrices.
- Multiply a matrix by a scalar.

Concepts

- scalar
- scalar multiplication

Lesson 3. Multiplying Matrices

Code: C304G0SU04L03

Objectives

- Multiply matrices.

- Use the properties of matrix multiplication.

Lesson 4. Transformations with Matrices

Code: C304G0SU04L04

Objectives

- Use matrices to determine the coordinates of a translated or dilated image.
- Use matrix multiplication to determine the coordinates of a reflected or rotated image.

Concepts

- coordinate matrix
- image
- preimage
- rotation
- vertex matrix

Lesson 5. Determinants and Cramer's Rule

Code: C304G0SU04L05

Objectives

- Evaluate determinants.
- Solve systems of linear equations by using Cramer's Rule.

Concepts

- coefficient matrix
- Cramer's rule
- determinant
- diagonal rule
- second-order determinant
- third-order determinant

Lesson 6. Inverse Matrices and Systems of Equations

Code: C304G0SU04L06

Objectives

- Find the inverse of a 2×2 matrix.
- Write and solve matrix equations for a system of equations.

Concepts

- constant matrix
- identity matrix
- inverse matrix
- matrix equation
- variable matrix

Unit 5. Quadratic Functions and Relations

At the end of this unit the student will have completed the objectives found in the following lessons.

General Objectives

- Graph quadratic functions.
- Solve quadratic equations.
- Perform operations with complex numbers.
- Graph and solve quadratic inequalities.

Lesson 0. Quadratic Functions and Relations

Code: C304G0SU05L00

Unit Documents: Lesson Review, Mid Unit Quiz, Practice Test, Preparing for Standardized Tests, Standardized Test Practice and Study Guide.

Lesson 1. Graphing Quadratic Functions

Code: C304G0SU05L01

Objectives

- Graph quadratic functions.
- Find and interpret the maximum and minimum values of a quadratic function.

Concepts

- axis of symmetry
- constant term
- linear term
- maximum value
- minimum value
- parabola
- quadratic function
- quadratic term
- vertex

Lesson 2. Solving Quadratic Equations by Graphing

Code: C304G0SU05L02

Objectives

- Solve quadratic equations by graphing.
- Estimate solutions of quadratic equations by graphing.

Concepts

- quadratic equation
- root
- standard form
- zero

Lesson 3. Solving Quadratic Equations by Factoring

Code: C304G0SU05L03

Objectives

- Write quadratic equations in intercept form.
- Solve quadratic equations by factoring.

Concepts

- factored form
- FOIL method

Lesson 4. Complex Numbers

Code: C304G0SU05L04

Objectives

- Perform operations with pure imaginary numbers.
- Perform operations with complex numbers.

Concepts

- complex conjugates
- complex number
- imaginary unit
- pure imaginary number

Lesson 5. Completing the Square

Code: C304G0SU05L05

Objectives

- Solve quadratic equations by using the Square Root Property.
- Solve quadratic equations by completing the square.

Concept

- completing the square

Lesson 6: The Quadratic Formula and the Discriminant

Code: C304G0SU05L06

Objectives

- Solve quadratic equations by using the Quadratic Formula.
- Use the discriminant to determine the number and type of roots of a quadratic equation.

Concepts

- discriminant
- quadratic formula

Lesson 7. Transformations with Quadratic Functions

Code: C304G0SU05L07

Objectives

- Write a quadratic function in the form $y = a(x - h)^2 + k$.
- Transform graphs of the form $y = a(x - h)^2 + k$.

Concept

- vertex form

Lesson 8. Quadratic Inequalities**Code:** C304G0SU05L08**Objectives**

- Graph quadratic inequalities in two variables.
- Solve quadratic inequalities in one variable.

Concept

- quadratic inequality

Unit 6. Polynomials and Polynomial Functions

At the end of this unit the student will have completed the objectives found in the following lessons.

General Objectives

- Add, subtract, multiply, divide, and factor polynomials.
- Analyze and graph polynomial functions.
- Evaluate polynomial functions and solve polynomial equations.
- Find factors and zeros of polynomial functions.

Lesson 0. Polynomials and Polynomial Functions

Code: C304G0SU06L00

Unit Documents: Lesson Review, Mid Unit Quiz, Practice Test, Preparing for Standardized Tests, Standardized Test Practice and Study Guide.

Lesson 1. Operations with Polynomials

Code: C304G0SU06L01

Objectives

- Multiply, divide, and simplify monomials and expressions involving powers.
- Add, subtract, and multiply polynomials.

Concepts

- degree of a polynomial
- simplify

Lesson 2. Dividing Polynomials

Code: C304G0SU06L02

Objectives

- Divide polynomials using long division.
- Divide polynomials using synthetic division.

Concept

- synthetic division

Lesson 3. Polynomial Functions

Code: C304G0SU06L03

Objectives

- Evaluate polynomial functions.
- Identify general shapes of graphs of polynomial functions.

Concepts

- end behavior
- leading coefficient
- polynomial function
- polynomial in one variable
- power function

- quantic function
- quartic function

Lesson 4. Analyzing Graphs of Polynomial Functions

Code: C304G0SU06L04

Objectives

- Graph polynomial functions and locate their zeros.
- Find the relative maxima and minima of polynomial functions.

Concepts

- extrema
- relative maximum
- relative minimum
- turning points

Lesson 5. Solving Polynomial Equations

Code: C304G0SU06L05

Objectives

- Factor polynomials.
- Solve polynomial equations by factoring.

Concepts

- prime polynomials
- quadratic form

Lesson 6. The Remainder and Factor Theorems

Code: C304G0SU06L06

Objectives

- Evaluate functions by using synthetic substitution.
- Determine whether a binomial is a factor of a polynomial by using synthetic substitution.

Concepts

- depressed polynomial
- synthetic substitution

Lesson 7. Roots and Zeros

Code: C304G0SU06L07

Objectives

- Determine the number and type of roots for a polynomial equation.
- Find the zeros of a polynomial function.

Lesson 8. Rational Zero Theorem

Code: C304G0SU06L08

Objectives

- Identify possible rational zeros of a polynomial function.

- Find all of the rational zeros of a polynomial function.

Concept

- Rational Zero Theorem

Unit 7. Inverses and Radical Functions and Relations

At the end of this unit the student will have completed the objectives found in the following lessons.

General Objectives

- Find compositions and inverses of functions.
- Graph and analyze square root functions and inequalities.
- Simplify and solve equations involving roots, radicals, and rational exponents.

Lesson 0. Inverses and Radical Functions and Relations

Code: C304G0SU07L00

Unit Documents: Lesson Review, Mid Unit Quiz, Practice Test, Preparing for Standardized Tests, Standardized Test Practice and Study Guide.

Lesson 1. Operations on Functions

Code: C304G0SU07L01

Objectives

- Find the sum, difference, product, and quotient of functions.
- Find the composition of functions.

Concept

- composition of functions

Lesson 2. Inverse Functions and Relations

Code: C304G0SU07L02

Objectives

- Find the inverse of a function or relation.
- Determine whether two functions or relations are inverses.

Concepts

- inverse function
- inverse relation

Lesson 3. Square Root Functions and Inequalities

Code: C304G0SU07L03

Objectives

- Graph and analyze square root functions.
- Graph square root inequalities.

Concepts

- radical function
- square root function
- square root inequality

Lesson 4. n th Roots**Code:** C304G0SU07L04**Objectives**

- Simplify radicals.
- Use a calculator to approximate radicals.

Concepts

- index
- n th root
- principal root
- radical sign
- radicand

Lesson 5. Operations with Radical Expressions**Code:** C304G0SU07L05**Objectives**

- Simplify radical expressions.
- Add, subtract, multiply, and divide radical expressions.

Concepts

- conjugate
- like radical expressions
- rationalizing the denominator

Lesson 6. Rational Exponents**Code:** C304G0SU07L06**Objectives:**

- Simplify expressions in exponential or radical form.
- Write expressions with rational exponents in radical form and vice versa.

Lesson 7. Solving Radical Equations and Inequalities**Code:** C304G0SU07L07**Objectives**

- Solve equations containing radicals.
- Solve inequalities containing radicals.

Concepts

- extraneous solution
- radical equation
- radical inequality

Unit 8. Exponential and Logarithmic Functions and Relations

At the end of this unit the student will have completed the objectives found in the following lessons.

General Objectives

- Graph exponential and logarithmic functions.
- Solve exponential and logarithmic equations and inequalities.
- Solve problems involving exponential growth and decay.

Lesson 0. Exponential and Logarithmic Functions and Relations

Code: C304G0SU08L00

Unit Documents: Lesson Review, Mid Unit Quiz, Practice Test, Preparing for Standardized Tests, Standardized Test Practice and Study Guide.

Lesson 1. Graphing Exponential Functions

Code: C304G0SU08L01

Objectives

- Graph exponential growth functions.
- Graph exponential decay functions.

Concepts

- asymptote
- decay factor
- exponential decay
- exponential function
- exponential growth
- growth factor

Lesson 2. Solving Exponential Equations and Inequalities

Code: C304G0SU08L02

Objectives

- Solve exponential equations.
- Solve exponential inequalities.

Concepts

- compound interest
- exponential equation
- exponential inequality

Lesson 3. Logarithms and Logarithmic Functions

Code: C304G0SU08L03

Objectives

- Evaluate logarithmic expressions.
- Graph logarithmic functions.

Concepts

- logarithm
- logarithmic function

Lesson 4. Solving Logarithmic Equations and Inequalities

Code: C304G0SU08L04

Objectives

- Solve logarithmic equations.
- Solve logarithmic inequalities.

Concepts

- logarithmic equation
- logarithmic inequality

Lesson 5. Properties of Logarithms

Code: C304G0SU08L05

Objectives

- Simplify and evaluate expressions using the properties of logarithms.
- Solve logarithmic equations using the properties of logarithms.

Lesson 6. Common Logarithms

Code: C304G0SU08L06

Objectives

- Solve exponential equations and inequalities using common logarithms.
- Evaluate logarithmic expressions using the Change of Base Formula.

Concepts

- change of base formula
- common logarithm

Lesson 7. Base e and Natural Logarithms

Code: C304G0SU08L07

Objectives

- Evaluate expressions involving the natural base and natural logarithm.
- Solve exponential equations and inequalities using natural logarithm.

Concepts

- natural base exponential function
- natural base, e
- natural logarithms

Lesson 8. Using Exponential and Logarithmic Functions

Code: C304G0SU08L08

Objectives

- Use logarithms to solve problems involving exponential growth and decay.
- Use logarithms to solve problems involving logistic growth.

Concepts

- logistic growth model
- rate of continuous decay
- rate of continuous growth

Unit 9. Rational Functions and Relations

At the end of this unit the student will have completed the objectives found in the following lessons.

General Objectives

- Simplify rational expressions.
- Graph rational functions.
- Solve direct, joint, and inverse variation problems.
- Solve rational equations and inequalities.

Lesson 0. Rational Functions and Relations

Code: C304G0SU09L00

Unit Documents: Lesson Review, Mid Unit Quiz, Practice Test, Preparing for Standardized Tests, Standardized Test Practice and Study Guide.

Lesson 1. Multiplying and Dividing Rational Expressions

Code: C304G0SU09L01

Objectives

- Simplify rational expressions.
- Simplify complex fractions.

Concepts

- complex fraction
- rational expression

Lesson 2. Adding and Subtracting Rational Expressions

Code: C304G0SU09L02

Objectives

- Determine the LCM of polynomials.
- Add and subtract rational expressions.

Lesson 3. Graphing Reciprocal Functions

Code: C304G0SU09L03

Objectives

- Determine properties of reciprocal functions.
- Graph transformations of reciprocal functions.

Concepts

- hyperbola
- reciprocal function

Lesson 4. Graphing Rational Functions

Code: C304G0SU09L04

Objectives

- Graph rational functions with vertical and horizontal asymptotes.

- Graph rational functions with oblique asymptotes and point discontinuity.

Concepts

- horizontal asymptote
- oblique asymptote
- point discontinuity
- rational function
- vertical asymptote

Lesson 5. Variation Functions

Code: C304G0SU09L05

Objectives

- Recognize and solve direct and joint variation problems.
- Recognize and solve inverse and combined variation problems.

Concepts

- combined variation
- constant of variation
- direct variation
- inverse variation
- joint variation

Lesson 6. Solving Rational Equations and Inequalities

Code: C304G0SU09L06

Objectives

- Solve rational equations.
- Solve rational inequalities.

Concepts

- rational equation
- rational inequality
- weighted average

Unit 10. Conic Sections

At the end of this unit the student will have completed the objectives found in the following lessons.

General Objectives

- Use the Midpoint and Distance Formulas.
- Write and graph equations of parabolas, circles, ellipses, and hyperbolas.
- Identify conic sections.
- Solve systems of quadratic equations and inequalities.

Lesson 0. Conic Sections

Code: C304G0SU10L00

Unit Documents: Lesson Review, Mid Unit Quiz, Practice Test, Preparing for Standardized Tests, Standardized Test Practice and Study Guide.

Lesson 1. Midpoint and Distance Formulas

Code: C304G0SU10L01

Objectives

- Find the midpoint of a segment on the coordinate plane.
- Find the distance between two points on the coordinate plane.

Lesson 2. Parabolas

Code: C304G0SU10L02

Objectives

- Write equations of parabolas in standard form.
- Graph parabolas.

Concepts

- directrix
- focus
- general form
- *latus rectum*
- parabola
- standard form

Lesson 3. Circles

Code: C304G0SU10L03

Objectives

- Write equations of circles.
- Graph circles.

Concepts

- center
- circle
- radius

Lesson 4. Ellipses**Code:** C304G0SU10L04**Objectives**

- Write equations of ellipses.
- Graph ellipses.

Concepts

- center
- constant sum
- co-vertices
- ellipse
- foci
- major axis
- minor axis
- vertices

Lesson 5. Hyperbolas**Code:** C304G0SU10L05**Objectives**

- Write equations of hyperbolas.
- Graph hyperbolas.

Concepts

- conjugate axis
- constant difference
- co-vertices
- foci
- hyperbola
- transverse axis
- vertices

Lesson 6. Identifying Conic Sections**Code:** C304G0SU10L06**Objectives**

- Write equations of conic sections in standard form.
- Identify conic sections from their equations.

Lesson 7. Solving Linear-Nonlinear Systems**Code:** C304G0SU10L07**Objectives**

- Solve systems of linear and nonlinear equations algebraically and graphically.
- Solve systems of linear and nonlinear inequalities graphically.

Unit 11. Sequences and Series

At the end of this unit the student will have completed the objectives found in the following lessons.

General Objectives

- Use arithmetic and geometric sequences and series.
- Use special sequences and iterate functions.
- Expand powers by using the Binomial Theorem.
- Prove statements by using mathematical induction.

Lesson 0. Sequences and Series

Code: C304G0SU11L00

Unit Documents: Lesson Review, Mid Unit Quiz, Practice Test, Preparing for Standardized Tests, Standardized Test Practice and Study Guide.

Lesson 1. Sequences as Functions

Code: C304G0SU11L01

Objectives

- Relate arithmetic sequences to linear functions.
- Relate geometric sequences to exponential functions.

Concepts

- arithmetic sequence
- common difference
- common ratio
- finite sequence
- geometric sequence
- infinite sequence
- sequence
- term

Lesson 2. Arithmetic Sequences and Series

Code: C304G0SU11L02

Objectives

- Use arithmetic sequences.
- Find sums of arithmetic series.

Concepts

- arithmetic means
- arithmetic series
- partial sum
- series
- *sigma* notation

Lesson 3. Geometric Sequences and Series

Code: C304G0SU11L03

Objectives

- Use geometric sequences.
- Find sums of geometric series.

Concepts

- geometric means
- geometric series

Lesson 4. Infinite Geometric Series

Code: C304G0SU11L04

Objectives

- Find sums of infinite geometric series.
- Write repeating decimals as fractions.

Concepts

- convergent series
- divergent series
- infinite geometric series
- infinity

Lesson 5. Recursion and Iteration

Code: C304G0SU11L05

Objectives

- Recognize and use special sequences.
- Iterate functions.

Concepts

- explicit formula
- Fibonacci sequence
- iteration
- recursive formula
- recursive sequence

Lesson 6. The Binomial Theorem

Code: C304G0SU11L06

Objectives

- Use Pascal's triangle to expand powers of binomials.
- Use the Binomial Theorem to expand powers of binomials.

Concepts

- Binomial Theorem
- Pascal's triangle

Lesson 7. Proof by Mathematical Induction

Code: C304G0SU11L07

Objectives

- Prove statements by using mathematical induction.
- Disprove statements by finding a counterexample.

Concepts

- induction hypothesis
- mathematical induction

Unit 12. Probability and Statistics

At the end of this unit the student will have completed the objectives found in the following lessons.

General Objectives

- Evaluate surveys, studies, and experiments.
- Create and use graphs of probability distributions.
- Use the Empirical Rule to find probabilities.
- Compare sample statistics and population statistics.

Lesson 0. Probability and Statistics

Code: C304G0SU12L00

Unit Documents: Lesson Review, Mid Unit Quiz, Practice Test, Preparing for Standardized Tests, Standardized Test Practice and Study Guide.

Lesson 1. Experiments, Surveys, and Observational Studies

Code: C304G0SU12L01

Objectives

- Evaluate surveys, studies, and experiments.
- Distinguish between correlation and causation.

Concepts

- biased
- causation
- census
- control group
- correlation
- experiment
- observational study
- population
- sample
- survey
- treatment group
- unbiased

Lesson 2. Statistical Analysis

Code: C304G0SU12L02

Objectives

- Use measures of central tendency and variation to compare sets of data.
- Explore measures of variation.

Concepts

- margin of sampling error
- measure of central tendency
- measure of variation

- parameter
- standard deviation
- statistic
- univariate data
- variable
- variance

Lesson 3. Conditional Probability

Code: C304G0SU12L03

Objectives

- Find probabilities of events given the occurrence of other events.
- Use contingency tables to find conditional probabilities.

Concepts

- conditional probability
- contingency table
- relative frequency

Lesson 4. Probability and Probability Distributions

Code: C304G0SU12L04

Objectives

- Find probabilities by using combinations and permutations.
- Create and use graphs of probability distributions.

Concepts

- discrete probability distribution
- expected value
- failure
- probability
- probability distribution
- random variable
- relative-frequency graph
- sample space
- success
- theoretical probability
- uniform distribution

Lesson 5. The Normal Distribution

Code: C304G0SU12L05

Objectives

- Determine whether a set of data appears to be normally distributed or skewed.
- Use the Empirical Rule to find probabilities.

Concepts

- continuous probability
- distribution

- normal distribution
- skewed distribution

Lesson 6. Hypothesis Testing

Code: C304G0SU12L06

Objectives

- Compare sample statistics and population parameters.
- Design experiments to test hypothesis.

Concepts

- alternative hypothesis
- confidence interval
- hypothesis
- inferential statistics
- null hypothesis
- statistical inference

Lesson 7. Binomial Distributions

Code: C304G0SU12L07

Objectives

- Find probabilities for binomial experiments.
- Find probabilities by using binomial distributions and expansions.

Concepts

- binomial distribution
- binomial experiment
- experimental probability

Unit 13. Trigonometric Functions

At the end of this unit the student will have completed the objectives found in the following lessons.

General Objectives

- Find values of trigonometric functions.
- Solve problems by using right triangle trigonometry.
- Solve triangles by using the Law of Sines and Law of Cosines.
- Graph trigonometric functions.

Lesson 0. Trigonometric Functions

Code: C304G0SU13L00

Unit Documents: Lesson Review, Mid Unit Quiz, Practice Test, Preparing for Standardized Tests, Standardized Test Practice and Study Guide.

Lesson 1. Trigonometric Functions in Right Triangles

Code: C304G0SU13L01

Objectives

- Find values of trigonometric functions for acute angles.
- Use trigonometric functions to find side lengths and angle measures of right triangles.

Concepts

- angle of depression
- angle of deviation
- cosecant
- cosine
- cotangent
- reciprocal functions
- secant
- sine
- tangent
- trigonometric function
- trigonometric ratio
- trigonometry

Lesson 2. Angles and Angle Measure

Code: C304G0SU13L02

Objectives

- Draw and find angles in standard position.
- Convert between degree measures and radian measures.

Concepts

- central angle
- coterminal angles

- initial side
- radian
- standard position
- terminal side

Lesson 3. Trigonometric Functions of General Angles

Code: C304G0SU13L03

Objectives

- Find values of trigonometric functions for general angles.
- Find values of trigonometric functions by using reference angles.

Concepts

- quadrantal angle
- reference angle

Lesson 4. Law of Sines

Code: C304G0SU13L04

Objectives

- Find the area of a triangle using two sides and an included angle.
- Use the Law of Sines to solve triangles.

Concepts

- Law of Sines
- solving a triangle

Lesson 5. Law of Cosines

Code: C304G0SU13L05

Objectives

- Use the Law of Cosines to solve triangles.
- Choose methods to solve triangles.

Concept

- Law of Cosines

Lesson 6. Circular Functions

Code: C304G0SU13L06

Objectives

- Find values of trigonometric functions based on the unit circle.
- Use the properties of periodic functions to evaluate trigonometric functions.

Concepts

- circular function
- cycle
- period
- periodic function
- unit circle

Lesson 7. Graphing Trigonometric Functions

Code: C304G0SU13L07

Objectives

- Describe and graph the sine, cosine, and tangent functions.
- Describe and graph other trigonometric functions.

Concepts

- amplitude
- frequency

Lesson 8. Translations of Trigonometric Graphs

Code: C304G0SU13L08

Objectives

- Graph horizontal translations of trigonometric graphs and find phase shifts.
- Graph vertical translations of trigonometric graphs.

Concepts

- midline
- phase shift
- vertical shift

Lesson 9. Inverse Trigonometric Functions

Code: C304G0SU13L09

Objectives

- Find values of inverse trigonometric functions.
- Solve equations by using inverse trigonometric functions.

Concepts

- Arccosine Function
- Arcsine function
- Arctangent function
- principal values

Unit 14. Trigonometric Identities and Equations

At the end of this unit the student will have completed the objectives found in the following lessons.

General Objectives

- Use and verify trigonometric identities.
- Use the sum and difference of angles identities.
- Use the double- and half-angle identities.
- Solve trigonometric equations.

Lesson 0. Trigonometric Identities and Equations

Code: C304G0SU14L00

Unit Documents: Lesson Review, Mid Unit Quiz, Practice Test, Preparing for Standardized Tests, Standardized Test Practice and Study Guide.

Lesson 1. Trigonometric Identities

Code: C304G0SU14L01

Objectives

- Use trigonometric identities to find trigonometric values.
- Use trigonometric identities to simplify expressions.

Concept

- trigonometric identity

Lesson 2. Verifying Trigonometric Identities

Code: C304G0SU14L02

Objectives

- Verify trigonometric identities by transforming one side of an equation into the form of the other side.
- Verify trigonometric identities by transforming each side of the equation into the same form.

Lesson 3. Sum and Difference of Angles Identities

Code: C304G0SU14L03

Objectives

- Find values of sine and cosine by using sum and difference identities.
- Verify trigonometric identities by using sum and difference identities.

Lesson 4. Double-Angle and Half Angle Identities

Code: C304G0SU14L04

Objectives

- Find values of sine and cosine by using double-angle identities.
- Find values of sine and cosine by using half-angle identities.

Lesson 5. Solving Trigonometric Equations

Code: C304G0SU14L05

Objectives

- Solve trigonometric equations.
- Find extraneous solutions from trigonometric equations.

Concept

- trigonometric equations