

Curriculum Guide College Algebra

Review Unit: Review of Basic Algebra

Biblical Worldview Essential Questions:

“Polynomial” literally means “many names.”

What is the significance of the many names for God in the Bible?

7 Lessons 10 days

CA#1

Objectives	Methods	Resources	Assessment
The students will 1. Learn basic set operations 2. Review exponents, properties of real numbers, and absolute value 3. Add/subtract/multiply/divide polynomials. 4. Factor polynomials. 5. Reduce/add/subtract/mult/divide rational expressions. 6. Work with nth roots and rational exponents. 7. Simplify radicals.	<ul style="list-style-type: none">● Flipped classroom● Teacher lecture● teacher working examples on the board● student guided practice of problems in book● cooperative learning groups● individual assistance● partner work● worksheets● homework● YouTube video● internet websites	College Algebra & Trigonometry, 6th ed Lial, Hornsby, Schneider, Daniels Pearson 2017	<ul style="list-style-type: none">● Check homework● Quizzes● Chapter test● Oral response● Board work

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Unit 1: Equations and Inequalities

Biblical Worldview Essential Questions:

What are some biblical guidelines for solving problems we encounter in our everyday lives?

8 Lessons, 16 days

CA#2, CA#5

Objectives	Methods	Resources	Assessment
1. Solve linear equations or equations that lead to linear equations. 2. Perform the four basic operations on complex numbers. 3. Solve quadratic equations using factoring, completing the square, and quadratic formula. 4. Solve quadratic equations in the complex number system. 5. Solve equations involving radicals. 6. Solve equations quadratic in form. 7. Solve higher degree polynomial equations by factoring. 8. Solve linear inequalities and express the answer in interval notation. 9. Solve equations and inequalities involving absolute value. 10. Solve applied problems.	<ul style="list-style-type: none">● Flipped classroom● Teacher lecture● teacher working examples on the board● student guided practice of problems in book● cooperative learning groups● individual assistance● partner work● worksheets● homework● YouTube video● internet websites	College Algebra & Trigonometry, 6th ed Lial, Hornsby, Schneider, Daniels Pearson 2017	<ul style="list-style-type: none">● Check homework● Quizzes● Chapter test● Oral response● Board work

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Unit 2: Graphs and Functions

Biblical Worldview Essential Questions:

A rectangular coordinate system allows one to locate any point with respect to the origin or to another point.
How does the Bible provide a frame of reference for our Christian life, with respect to God and with respect to other people?

Functions have dependent and independent variables.
How is mankind dependent on God? How is God independent of mankind?

8 Lessons, 16 days

CA#2

Objectives	Methods	Resources	Assessment
The students will 1. Use the distance and midpoint formulas. 2. Graph equations by plotting points. 3. Use center-radius form and general form to graph circles. 4. Determine whether a relation determines a function. 5. Evaluate a function. 6. Find the domain of a function. 7. Find slope, average rate of change, and standard form of linear functions. 8. Find the intercepts of an equation. 9. Find point slope form, slope-intercept form, parallel and perpendicular lines. 10. Graph basic functions. 11. Use graphing techniques to transform graphs of basic functions. 12. Use operations on functions and compose multiple functions.	<ul style="list-style-type: none">● Flipped classroom● Teacher lecture● teacher working examples on the board● student guided practice of problems in book● cooperative learning groups● individual assistance● partner work● worksheets● homework● YouTube video● internet websites	College Algebra & Trigonometry, 6th ed Lial, Hornsby, Schneider, Daniels Pearson 2017	<ul style="list-style-type: none">● Check homework● Quizzes● Chapter test● Oral response● Board work

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Unit 3: Polynomial and Rational Functions

Biblical Worldview Essential Questions:

Quadratic functions are characterized by either an absolute maximum or an absolute minimum.
Describe the absolute maximum and the absolute minimum in eternity?

An asymptote is a line that a function heads toward but never reaches.
How is this analogous to the Christian life on earth?

6 Lessons, 14 days

CA#2, CA#4

Objectives	Methods	Resources	Assessment
<p>The students will</p> <ol style="list-style-type: none"> 1. Find polynomial and quadratic functions. 2. Complete the square. 3. Find the vertex formula. 4. Use synthetic division, remainder theorem, and find potential zeros of polynomial functions. 5. Use the factor theorem, rational zeros theorem, and conjugate zeros theorem to find zeros. 6. Find zeros of a polynomial function. 7. Graph and apply information from polynomial functions including behavior at zeros, turning points and end behavior, the intermediate value theorem and boundedness theorem. 8. Find asymptotes and graph rational functions. 9. Find direct, inverse, combined, and joint variation. 	<ul style="list-style-type: none"> ● Flipped classroom ● Teacher lecture ● teacher working examples on the board ● student guided practice of problems in book ● cooperative learning groups ● individual assistance ● partner work ● worksheets ● homework ● YouTube video ● internet websites 	<p>College Algebra & Trigonometry, 6th ed Lial, Hornsby, Schneider, Daniels Pearson 2017</p>	<ul style="list-style-type: none"> ● Check homework ● Quizzes ● Chapter test ● Oral response ● Board work

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Unit 4: Exponential and Logarithmic Functions

Biblical Worldview Essential Questions:

Why did the lifespans of the patriarchs from Noah to Joseph decrease exponentially?

6 Lessons, 12 days

CA#4, CA#5

Objectives	Methods	Resources	Assessment
The students will 1. Find, verify and graph the inverse of a function. 2. Evaluate and graph exponential functions. 3. Define the number e . 4. Change exponential expressions to logarithmic expressions, and vice versa. 5. Evaluate and determine the domain of a logarithmic function. 6. Work with properties of logarithms. 7. Solve exponential and logarithmic equations. 8. Work with applications involving the law of uninhibited growth and the law of decay.	<ul style="list-style-type: none">● Flipped classroom● Teacher lecture● teacher working examples on the board● student guided practice of problems in book● cooperative learning groups● individual assistance● partner work● worksheets● homework● YouTube video● internet websites	College Algebra & Trigonometry, 6th ed Lial, Hornsby, Schneider, Daniels Pearson 2017	<ul style="list-style-type: none">● Check homework● Quizzes● Chapter test● Oral response● Board work

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Unit 5: Trigonometric Functions

Biblical Worldview Essential Questions:

Where is the Trinity found in scripture?

4 Lessons, 12 days

CA#3, CA#4

Objectives	Methods	Resources	Assessment
The students will 1. Find degree measure 2. Find coterminal and reference angles. 3. Find the values of trigonometric functions of acute angles. 4. Use reciprocal identities, pythagorean identities, and quotient identities. 5. Find the exact value of trigonometric functions for 30, 45, and 60 degrees. 6. Find the exact values for general angles. 7. Solve right triangles.	<ul style="list-style-type: none">● Flipped classroom● Teacher lecture● teacher working examples on the board● student guided practice of problems in book● cooperative learning groups● individual assistance● partner work● worksheets● homework● YouTube video● internet websites	College Algebra & Trigonometry, 6th ed Lial, Hornsby, Schneider, Daniels Pearson 2017	<ul style="list-style-type: none">● Check homework● Quizzes● Chapter test● Oral response● Board work

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Unit 6: The Circular Functions and Their Graphs

Biblical Worldview Essential Questions:

What did God create or establish that are periodic in nature? (i.e. they recur repetitively and regularly)

7 Lessons, 15 days

CA#3, CA#4

Objectives	Methods	Resources	Assessment
The students will 1. Convert between degrees and radians 2. Find the length of an arc on a circle. 3 Find the exact value of trigonometric functions for 30, 45, and 60 degrees. 4. Find the exact values for general angles. 5. Use the unit circle to find exact values of trigonometric functions. 6. Graph sine and cosine functions. 7. Determine amplitude and period of sinusoidal functions. 8. Graph tangent, cotangent, secant, and cosecant functions. 9. Use periodic and even/odd properties to evaluate trig functions.	<ul style="list-style-type: none">● Flipped classroom● Teacher lecture● teacher working examples on the board● student guided practice of problems in book● cooperative learning groups● individual assistance● partner work● worksheets● homework● YouTube video● internet websites	College Algebra & Trigonometry, 6th ed Lial, Hornsby, Schneider, Daniels Pearson 2017	<ul style="list-style-type: none">● Check homework● Quizzes● Chapter test● Oral response● Board work

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Unit 7: Trigonometric Identities and Equations

Biblical Worldview Essential Questions:

Many of God's commands are negatively stated, such as "Thou shall not steal." Is it possible to restate them in a positive way? Is there benefit in doing so?

7 Lessons, 16 days

CA#3, CA#4

Objectives	Methods	Resources	Assessment
The students will 1. Use the fundamental identities of trigonometric functions 2. Verify trigonometric identities. 3. Use the sum and difference identities. 4. Use double-angle and half-angle identities 5. Find the inverse of trigonometric functions 6. Solve trigonometric equations. 7. Find applications of trigonometric equations. 8. Solve equations using inverse trigonometric functions.	<ul style="list-style-type: none">● Flipped classroom● Teacher lecture● teacher working examples on the board● student guided practice of problems in book● cooperative learning groups● individual assistance● partner work● worksheets● homework● YouTube video● internet websites	College Algebra & Trigonometry, 6th ed Lial, Hornsby, Schneider, Daniels Pearson 2017	<ul style="list-style-type: none">● Check homework● Quizzes● Chapter test● Oral response● Board work

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Unit 8: Applications of Trigonometry

Biblical Worldview Essential Questions:

Word problems or “story” problems are important for applying math concepts to the real world.
 Why did Jesus tell “stories” or parables as a regular part of His teaching?

12 Lessons

CA#7

Objectives	Methods	Resources	Assessment
The students will 1. Solve triangles using the law of sines. 2. Solve triangles using the law of cosines. 3. Solve applied problems using law of sines and law of cosines. 4. Find vectors and dot products 5. Convert between rectangular and polar form 6. Use De Moivre’s Theorem 7. Find polar equations and graphs 8. Solve parametric equations.	<ul style="list-style-type: none"> ● Flipped classroom ● Teacher lecture ● teacher working examples on the board ● student guided practice of problems in book ● cooperative learning groups ● individual assistance ● partner work ● worksheets ● homework ● YouTube video ● internet websites 	College Algebra & Trigonometry, 6th ed Lial, Hornsby, Schneider, Daniels Pearson 2017	<ul style="list-style-type: none"> ● Check homework ● Quizzes ● Chapter test ● Oral response ● Board work

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Unit 9: Systems and Matrices (Optional)

Biblical Worldview Essential Questions:

What happens when you have too many “variables” in your life?

8 Lessons, 15 days

CA#3, CA#6

Objectives	Methods	Resources	Assessment
The students will 1. Solve systems of linear equations using graphing, substitution and elimination. 2. Find the matrix solution to a linear system. 3. Find the determinant of a linear system. 4. Solve partial fractions. 5. Solve nonlinear systems of equations with nonreal and real solutions. 6. Solve systems of inequalities and use linear programming. 7. Use properties of matrices to combine multiple matrices into one matrix. 8. Find the inverse of a matrix.	<ul style="list-style-type: none">● Flipped classroom● Teacher lecture● teacher working examples on the board● student guided practice of problems in book● cooperative learning groups● individual assistance● partner work● worksheets● homework● YouTube video● internet websites	College Algebra & Trigonometry, 6th ed Lial, Hornsby, Schneider, Daniels Pearson 2017	<ul style="list-style-type: none">● Check homework● Quizzes● Chapter test● Oral response● Board work

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Unit 10: Analytic Geometry (Optional)

Biblical Worldview Essential Questions:

According to Scripture, what things remain constant, and what things change?

4 Lessons, 8 days

CA#7

Objectives	Methods	Resources	Assessment
The students will 1. Find conic sections. 2. Find the equation of a parabola and graph them. 3. Find the equations and graph ellipses using translations. 4. Find equations and graphs of hyperbolas. 5. Identify conic sections and their characteristics.	<ul style="list-style-type: none">● Flipped classroom● Teacher lecture● teacher working examples on the board● student guided practice of problems in book● cooperative learning groups● individual assistance● partner work● worksheets● homework● YouTube video● internet websites	College Algebra & Trigonometry, 6th ed Lial, Hornsby, Schneider, Daniels Pearson 2017	<ul style="list-style-type: none">● Check homework● Quizzes● Chapter test● Oral response● Board work

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Unit 11: Further Topics in Algebra (Optional)

Biblical Worldview Essential Questions:

What sequence of events led to Christ's crucifixion?

7 Lessons, 12 days

CA#8

Objectives	Methods	Resources	Assessment
The students will 1. Find sequences and series. 2. Find algebraic sequences and series. 3. Find geometric sequences and series. 4. Use the binomial theorem to expand a binomial. 5. Use mathematical induction and find proof of statements. 6. Find permutations and combinations of numbers. 7. Learn the basics of probability and Venn diagrams.	<ul style="list-style-type: none">● Flipped classroom● Teacher lecture● teacher working examples on the board● student guided practice of problems in book● cooperative learning groups● individual assistance● partner work● worksheets● homework● YouTube video● internet websites	College Algebra & Trigonometry, 6th ed Lial, Hornsby, Schneider, Daniels Pearson 2017	<ul style="list-style-type: none">● Check homework● Quizzes● Chapter test● Oral response● Board work