COMMON CORE ALGEBRA II

VERSION 1.0

BY KIRK WEILER

UNIT #1 – ALGEBRAIC ESSENTIALS REVIEW – 6 LESSONS

• Lesson #1 – Variables, Terms and Expressions
• Lesson #2 – Solving Linear Equations
• Lesson #3 – Common Algebraic Expressions
• Lesson #4 – Basic Exponent Manipulation
• Lesson #5 – Multiplying Polynomials
• Lesson #6 – Using Tables on Your Calculator

UNIT #2 – FUNCTIONS AS THE CORNERSTONES OF ALGEBRA – 7 LESSONS

• Lesson #1 – Introduction to Functions
• Lesson #2 – Function Notation
• Lesson #3 – Function Composition
• Lesson #4 – The Domain and Range of a Function
• Lesson #5 – One to One Functions
• Lesson #6 – Inverse Functions
• Lesson #7 – Key Features of Functions

UNIT #3 – LINEAR FUNCTIONS, EQUATIONS, AND THEIR ALGEBRA – 6 LESSONS

• Lesson #1 – Direct Variation
• Lesson #2 – Average Rate of Change
• Lesson #3 – Forms of a Line
• Lesson #4 – Linear Modeling
• Lesson #5 – Inverses of Linear Functions
• Lesson #6 – Piecewise Linear Functions
• Lesson #7 - Systems of Linear Equations (Primarily 3 by 3)
UNIT #4 – EXPONENTIAL AND LOGARITHMIC FUNCTIONS – 13 LESSONS

- Lesson #1 – Integer Exponents
- Lesson #2 – Rational Exponents
- Lesson #3 – Exponential Function Basics
- Lesson #4 – Finding Equations of Exponentials
- Lesson #5 – The Method of Common Bases
- Lesson #6 – Exponential Modeling with Percent Growth and Decay
- Lesson #7 – Mindful Percent Manipulations
- Lesson #8 – Introduction to Logarithms
- Lesson #9 – Graphs of Logarithms
- Lesson #10 – Logarithm Laws
- Lesson #11 – Solving Exponential Equations Using Logarithms
- Lesson #12 – The Number e and the Natural Logarithm
- Lesson #13 – Compound Interest
- Lesson #14 – Newton's Law of Cooling

UNIT #5 – SEQUENCES AND SERIES – 6 LESSONS

- Lesson #1 – Sequences
- Lesson #2 – Arithmetic and Geometric Sequences
- Lesson #3 – Summation Notation
- Lesson #4 – Arithmetic Series
- Lesson #5 – Geometric Series
- Lesson #6 – Mortgage Payments

UNIT #6 – QUADRATIC FUNCTIONS AND THEIR ALGEBRA – 11 LESSONS

- Lesson #1 – Quadratic Function Review
- Lesson #2 – Factoring
- Lesson #3 – Factoring Trinomials
- Lesson #4 – Complete Factoring
- Lesson #5 – Factoring by Grouping
- Lesson #6 – The Zero Product Law
- Lesson #7 – Quadratic Inequalities in One Variable
- Lesson #8 – Completing the Square and Shifting Parabolas
- Lesson #9 – Modeling with Quadratic Functions
- Lesson #10 – Equations of Circles
- Lesson #11 – The Locus Definition of a Parabola
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## Unit 7 – Transformations of Functions – 5 Lessons

- Lesson 1 – Shifting Functions
- Lesson 2 – Reflecting Parabolas
- Lesson 3 – Vertically Stretching Functions
- Lesson 4 – Horizontal Stretching Functions
- Lesson 5 – Even and Odd Functions

## Unit 8 – Radicals and the Quadratic Formula – 7 Lessons

- Lesson 1 – Square Root Functions
- Lesson 2 – Solving Square Root Equations
- Lesson 3 – The Basic Exponent Properties
- Lesson 4 – More Work with Fractional Exponents
- Lesson 5 – More Exponent Practice
- Lesson 6 – The Quadratic Formula
- Lesson 7 – More Work with the Quadratic Formula

## Unit 9 – Complex Numbers – 4 Lessons

- Lesson 1 – Imaginary Numbers
- Lesson 2 – Complex Numbers
- Lesson 3 – Solving Quadratic Equations with Complex Solutions
- Lesson 4 – The Discriminant of a Quadratic

## Unit 10 – Polynomial and Rational Functions – 13 Lessons

- Lesson 1 – Power Functions
- Lesson 2 – Graphs and Zeroes of a Polynomial
- Lesson 3 – Creating Polynomial Equations
- Lesson 4 – Polynomial Identities
- Lesson 5 – Introduction to Rational Functions
- Lesson 6 – Simplifying Rational Expressions
- Lesson 7 – Multiplying and Dividing Rational Expressions
- Lesson 8 – Combing Rational Expressions Using Addition and Subtraction
- Lesson 9 – Complex Fractions
- Lesson 10 – Polynomial Long Division
- Lesson 11 – The Remainder Theorem
- Lesson 12 – Solving Rational Equations
- Lesson 13 – Solving Rational Inequalities
- Lesson 14 - Reasoning About Radical and Rational Equations
UNIT #11 – THE CIRCULAR FUNCTIONS – 10 LESSONS

- Lesson #1 – Rotations and Angle Terminology
- Lesson #2 – Radian Angle Measurement
- Lesson #3 – The Unit Circle
- Lesson #4 – The Definition of the Sine and Cosine Functions
- Lesson #5 – More Work with the Sine and Cosine Functions
- Lesson #6 – Basic Graphs of Sine and Cosine
- Lesson #7 – Vertical Shifting of Sinusoidal Graphs
- Lesson #8 – The Frequency and Period of a Sinusoidal Graph
- Lesson #9 – Sinusoidal Modeling
- Lesson #10 – The Tangent Function
- Lesson #11 - The Reciprocal Functions

UNIT #12 – PROBABILITY – 7 LESSONS

- Lesson #1 – Introduction to Probability
- Lesson #2 – Sets and Probability
- Lesson #3 – Adding Probabilities
- Lesson #4 – Conditional Probability
- Lesson #5 – Independent and Dependent Events
- Lesson #6 – Multiplying Probabilities

UNIT #13 – STATISTICS – 9 LESSONS

- Lesson #1 – Variability and Sampling
- Lesson #2 – Population Parameters
- Lesson #3 – The Normal Distributions
- Lesson #4 – The Normal Distribution and Z-Scores
- Lesson #5 – Sample Means
- Lesson #6 – Sample Proportions
- Lesson #7 – The Difference in Samples Means
- Lesson #8 – Linear Regression and Lines of Best Fit
- Lesson #9 – Other Types of Regression

TOTAL LESSON COUNT = 107