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  A-CED.1
- Lesson #3 – Common Algebraic Expressions
- Lesson #4 – Basic Exponent Manipulation  N-RN.2
- Lesson #5 – Multiplying Polynomials  A-SSE.2
- 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  F-BF.4
- Lesson #7 – Key Features of Functions  F-IF.9, F-IF.4

UNIT #3 – LINEAR FUNCTIONS, EQUATIONS, AND THEIR ALGEBRA – 7 LESSONS

- Lesson #1 – Direct Variation
- Lesson #2 – Average Rate of Change  F-IF.6
- Lesson #3 – Forms of a Line  F-LE.2
- Lesson #4 – Linear Modeling  F-LE.5
- Lesson #5 – Inverses of Linear Functions  F-BF.4
- Lesson #6 – Piecewise Linear Functions
- Lesson #7 - Systems of Linear Equations (Primarily 3 by 3)  A-REI.6
UNIT #4 – EXPONENTIAL AND LOGARITHMIC FUNCTIONS – 14 LESSONS

- Lesson #1 – Integer Exponents N-RN.2
- Lesson #2 – Rational Exponents N-RN.1, N-RN.2
- Lesson #3 – Exponential Function Basics F-LE.5
- Lesson #4 – Finding Equations of Exponentials F-LE.2
- Lesson #5 – The Method of Common Bases A-CED.2
- Lesson #6 – Exponential Modeling with Percent Growth and Decay A-CED.1, A-SSE.3
- Lesson #7 – Mindful Percent Manipulations A-SSE.3
- Lesson #8 – Introduction to Logarithms
- Lesson #9 – Graphs of Logarithms F-IF.4, F-IF.7(e)
- Lesson #10 – Logarithm Laws
- Lesson #11 – Solving Exponential Equations Using Logarithms F-LE.4
- Lesson #12 – The Number e and the Natural Logarithm F-LE.4
- Lesson #13 – Compound Interest F-IF.8, F-BF.1(a), A-SSE.3
- Lesson #14 – Newton's Law of Cooling F-BF.1(b)

UNIT #5 – SEQUENCES AND SERIES – 6 LESSONS

- Lesson #1 – Sequences F-IF.3, F-BF.2
- Lesson #2 – Arithmetic and Geometric Sequences F-BF.2, F-LE.2
- Lesson #3 – Summation Notation A-SSE.4
- Lesson #4 – Arithmetic Series
- Lesson #5 – Geometric Series A-SSE.4
- Lesson #6 – Mortgage Payments A-SSE.4

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

- Lesson #1 – Quadratic Function Review F-IF.4
- Lesson #2 – Factoring A-SSE.2
- Lesson #3 – Factoring Trinomials A-SSE.2
- Lesson #4 – Complete Factoring A-SSE.2
- Lesson #5 – Factoring by Grouping A-SSE.2
- Lesson #6 – The Zero Product Law A-APR.3, A-REI.4
- Lesson #7 – Quadratic Inequalities in One Variable A-CED.1
- Lesson #8 – Completing the Square and Shifting Parabolas F-BF.3
- Lesson #9 – Modeling with Quadratic Functions A-CED.1
- Lesson #10 – Equations of Circles A-REI.7
- Lesson #11 – The Locus Definition of a Parabola G-GPE.2
### UNIT #7 – TRANSFORMATIONS OF FUNCTIONS – 5 LESSONS

- Lesson #1 – Shifting Functions  
  - Math: F-BF.3
- Lesson #2 – Reflecting Parabolas  
  - Math: F-BF.3
- Lesson #3 – Vertically Stretching of Functions  
  - Math: F-BF.3
- Lesson #4 – Horizontal Stretching of Functions  
  - Math: F-BF.3
- Lesson #5 – Even and Odd Functions  
  - Math: F-BF.3

### UNIT #8 – RADICALS AND THE QUADRATIC FORMULA – 7 LESSONS

- Lesson #1 – Square Root Functions  
  - Math: F-IF.4
- Lesson #2 – Solving Square Root Equations  
  - Math: A-REI.2
- Lesson #3 – The Basic Exponent Properties  
  - Math: N-RN.2
- Lesson #4 – Fractional Exponents Revisited  
  - Math: N-RN.1, N-RN.2
- Lesson #5 – More Exponent Practice  
  - Math: N-RN.2
- Lesson #6 – The Quadratic Formula  
  - Math: A-REI.4(b)
- Lesson #7 – More Work with the Quadratic Formula  
  - Math: A-REI.4(b)

### UNIT #9 – COMPLEX NUMBERS – 4 LESSONS

- Lesson #1 – Imaginary Numbers  
  - Math: N-CN.1
- Lesson #2 – Complex Numbers  
  - Math: N-CN.1, N-CN.2
- Lesson #3 – Solving Quadratic Equations with Complex Solutions  
  - Math: A-REI.4, N-CN.7
- Lesson #4 – The Discriminant of a Quadratic  
  - Math: A-REI.4, N-CN.7

### UNIT #10 – POLYNOMIAL AND RATIONAL FUNCTIONS – 14 LESSONS

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

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

### UNIT #12 – PROBABILITY – 6 LESSONS

- Lesson #1 – Introduction to Probability
- Lesson #2 – Sets and Probability  **S-CP.1**
- Lesson #3 – Adding Probabilities  **S-CP.7**
- Lesson #4 – Conditional Probability  **S-CP.3, S-CP.4, S-CP.5, S-CP.6**
- Lesson #5 – Independent and Dependent Events  **S-CP.2, S-CP.4, S-CP.5**
- Lesson #6 – Multiplying Probabilities  **S-CP.4, S-CP.2**

### UNIT #13 – STATISTICS– 9 LESSONS

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

**TOTAL LESSON COUNT = 107**