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Below is a list of topics for a general Algebra II Class. Dr. Long can teach any of these topics and/or provide homework help. Dr. Long believes all math is a skill that needs consistent practice to master.

Algebra II Topics:

1. Functions and Relations:

- Definition of a function
- Function notation
- Domain and range of functions
- Operations on functions (addition, subtraction, multiplication, division, composition)
- Inverse functions
- Transformations of functions (translations, reflections, stretches, compressions)

2. Linear Functions and Equations:

- Review of linear functions
- Writing equations of lines in various forms (slope-intercept, point-slope, standard)
- Modeling with linear functions
- Linear regression and correlation

3. Quadratic Functions and Equations:

- Review of quadratic functions and equations
- Graphing quadratic functions
- Solving quadratic equations by factoring, completing the square, and using the quadratic formula
- Applications involving quadratic functions

4. Polynomial Functions and Equations:

- Characteristics of polynomial functions (degree, leading coefficient, end behavior)
- Graphing polynomial functions
- Solving polynomial equations (factoring, synthetic division, long division)
- Fundamental Theorem of Algebra

5. Rational Functions and Equations:

- Simplifying rational expressions
- Graphing rational functions
- Asymptotes and holes
- Solving rational equations

6. Exponential and Logarithmic Functions:

- Exponential functions and their properties
- Logarithmic functions and their properties
- Graphing exponential and logarithmic functions
- Solving exponential and logarithmic equations
- Applications of exponential and logarithmic functions

7. Sequences and Series:

- Arithmetic sequences and series
- Geometric sequences and series
- Recursive sequences
- Finding sums of finite and infinite sequences

8. Trigonometric Functions:

- Introduction to trigonometric functions (sine, cosine, tangent)
- Graphs of trigonometric functions
- Trigonometric identities
- Solving trigonometric equations
- Applications of trigonometry (right triangle trigonometry, modeling periodic phenomena)

9. Conic Sections:

- Introduction to conic sections (circle, ellipse, hyperbola, parabola)
- Graphing conic sections
- Writing equations of conic sections
- Applications involving conic sections

10. Matrices and Determinants:

- Operations with matrices (addition, subtraction, scalar multiplication, matrix multiplication)
- Determinants and inverses of matrices
- Solving systems of equations using matrices

11. Probability and Statistics:

- Permutations and combinations
- Probability distributions
- Measures of central tendency and dispersion
- Sampling and surveys

- Normal distribution and z-scores