



Algebra 2B: Full Course Summary

Note: If this course is intended to be a Credit Recovery course, the following assumptions apply:

- This course is a core course at the “Basic” level in Connections Academy’s system, which titles courses as Basic, Standard, Honors, or Advanced Placement (AP).
- The student has previously taken this or a similar course but did not achieve a passing grade based on his/her school’s grading scale.
- This course will be modified by the teacher in order to skip over areas in which the student shows understanding of the material, leaving more time to focus on gaps in the student’s knowledge or understanding.
- Because Credit Recovery courses will be shortened and/or modified based on individual student needs, these courses are generally **not** appropriate for students who have **not** previously taken this or a similar course, nor for students wishing to accelerate their high school studies.

If a student wishes to take this course for the first time he/she will be expected to cover all material in the course without the above-noted modifications. Students must discuss this option with the NaCA Admission and Support Representative prior to enrolling in the course for the first time.

Course Summary

This is the second of two courses that comprise Basic Algebra 2. In this course, the student will begin exploring radical functions, rational exponents, as well as exponential and logarithmic functions. Then the student will study rational functions, quadratic relations, and conic sections. Finally, the student will review sequences, series, probability, and statistics while expanding his previous knowledge of using distributions and conditional probability.

Throughout the course the student will be introduced to many problem-solving strategies, exposed to various technologies, and taught test-taking strategies.

Unit 1: Functions and Operations

In this unit, you will use your knowledge of the properties of linear and quadratic functions to classify and examine polynomials and polynomial functions. Then, you will learn how to find linear factors and zeros of a polynomial function, divide polynomials, and solve polynomial equations. You will be introduced to several methods of finding the roots of polynomial equations including the Rational Root Theorem, Irrational Root Theorem, and the Imaginary Root Theorem. You will also solve polynomial equations with complex roots using the Fundamental Theorem of Algebra. At the end of this unit, you will evaluate probability problems using permutations, combinations, Pascal's Triangle, and the Binomial Theorem.

Lessons

1. Polynomial Functions: 1
2. Polynomial Functions: 2
3. Polynomials and Linear Factors: 1
4. Polynomials and Linear Factors: 2
5. Dividing Polynomials
6. Solving Polynomial Equations

7. Function Operations: 1
8. Function Operations: 2
9. Inverse Relations and Functions: 1
10. Inverse Relations and Functions: 2
11. Functions and Operations Review
12. Functions and Operations Test

Unit 2: Exponential and Logarithmic Functions

In this unit, you will begin your study of exponential and logarithmic functions by exploring exponential models such as exponential growth and decay. There are many real-world applications of exponential functions including compound interest, depreciation, population growth, and radioactive decay. You will define and learn the properties of exponential and logarithmic functions. Then, you will explore logarithmic functions as inverses and natural logarithms. At the end of this unit, you will apply what you learned in this unit to solve exponential and logarithmic equations.

Lessons

1. Exploring Exponential Models: 1
2. Exploring Exponential Models: 2
3. Properties of Exponential Functions: 1
4. Properties of Exponential Functions: 2
5. Logarithmic Functions as Inverses: 1
6. Logarithmic Functions as Inverses: 2
7. Properties of Logarithms
8. Exponential and Logarithmic Equations: 1
9. Exponential and Logarithmic Equations: 2
10. Natural Logarithms
11. Exponential and Logarithmic Functions Review
12. Exponential and Logarithmic Functions Test

Unit 3: Rational Functions

In this unit, you will expand your knowledge of rational functions. You will explore and graph inverse variations. You will learn how to find points of discontinuity and vertical asymptotes using the graphs of rational functions. Then, you will review how to simplify rational expressions. You will use algebraic formulas to add and subtract rational expressions. You will solve rational equations and check the solutions for extraneous answers. Finally, you will use algebra to solve problems involving probability of multiple events.

Lessons

1. Inverse Variation
2. The Reciprocal Function Family: 1
3. The Reciprocal Function Family: 2
4. Rational Functions and Their Graphs: 1
5. Rational Functions and Their Graphs: 2
6. Rational Expressions
7. Rational Functions Review
8. Rational Functions Test

Unit 4: Optional Unit: Conics

In this unit, you will identify the curves of a conic section and graph several equations that describe them. You will also write and solve equations of a circle and ellipse using the center and radius of a circle and the foci of an ellipse, respectively.

Lessons

1. Exploring Conic Sections
2. Circles
3. Ellipses
4. Hyperbolas

Unit 5: Sequences and Series

In this unit, you will continue your study of sequences and series. You will identify and use formulas to generate mathematical patterns, arithmetic sequences, and geometric sequences. Then, you will evaluate arithmetic series using summation notation. You will define and understand the difference between a finite and an infinite geometric series. At the end of this unit, you will find the area of a curve using inscribed and circumscribed rectangles.

Lessons

1. Mathematical Patterns
2. Arithmetic Sequences
3. Geometric Sequences
4. Arithmetic Series: 1
5. Arithmetic Series: 2
6. Geometric Series: 1
7. Geometric Series: 2
8. Sequences and Series Review
9. Sequences and Series Test

Unit 6: Probability

In this unit, you will expand your knowledge of probability. You will explore probability distributions because you will use them for the rest of this unit. You will solve conditional probability problems using formulas and tree diagrams.

Lessons

1. Probability
2. Probability of Multiple Events: 1
3. Probability of Multiple Events: 2
4. Probability Distributions: 1
5. Probability Distributions: 2
6. Conditional Probability: 1
7. Conditional Probability: 2
8. Probability Review
9. Probability Test

Unit 7: Statistics

In this unit, you will expand your knowledge of statistics. You will analyze data by calculating the measures of central tendency. You will find the standard deviation and use it to interpret the values of a data set. Then, you will define and practice the terms sample, sample proportion, random sample, and margin of error while solving real-world sample problems. Finally, you will solve problems involving binomial and normal distributions.

Lessons

1. Analyzing Data: 1
2. Analyzing Data: 2
3. Standard Deviation: 1
4. Standard Deviation: 2
5. Working With Samples: 1
6. Working With Samples: 2
7. Normal Distributions: 1
8. Normal Distributions: 2
9. Statistics Review
10. Statistics Test

Unit 8: Basic Algebra 2 B Final

In this unit, you will have the opportunity to prepare for and take the final exam. Since this is a comprehensive exam, it may be helpful to organize your notes in the order of the course outline before you begin to review. Using the test-taking strategies that you have previously learned can help you be successful with both objective and essay questions.

Lessons

1. Algebra 2 B Final Review
2. Algebra 2 B Final Exam

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