



Pre-Algebra B: Full Course Summary

Pre-Algebra B Course Summary

This is the second of two courses that comprise Pre-Algebra. In this course, the student will be introduced to basic algebraic principles. The student will explore and use graphs to solve linear relations and functions, and will be introduced to basic concepts in geometry including angle relationships, parallel lines, polygons, circles, translations, and rotations. Next, the student will apply their knowledge of geometry and algebra to solve area and volume problems. Then, the student will examine properties of right triangles, data analysis, and probability. Finally, the student will explore nonlinear functions and polynomials.

Prerequisites: This course is recommended for students who were not successful in 8th grade Pre-Algebra and/or need more reinforcement before beginning Algebra 1. It is recommended that students successfully completed Pre-Algebra A or 8th grade Pre-Algebra A.

Unit 1: Linear Functions and Graphing

In this unit, you will learn how to identify relations and functions. You will develop the necessary skills to solve systems of linear equations and inequalities by graphing, including plotting points and using the slope and y-intercept. In addition to graphing linear equations, you will also write rules for linear functions from word problems and tables. Finally, you will use real-world examples to find trends and make predictions from scatter plots.

Lessons

1. Relations and Functions
2. Equations With Two Variables: 1
3. Equations With Two Variables: 2
4. Slope and y-intercept: 1
5. Slope and y-intercept: 2
6. Writing Rules for Linear Functions
7. Scatter Plots
8. Solve by Graphing
9. Solving Systems of Linear Equations: 1
10. Solving Systems of Linear Equations: 2
11. Graphing Linear Inequalities
12. Review
13. Unit Test

Unit 2: Spatial Thinking

In this unit, you will be introduced to the basic figures of geometry, including points, lines, segments, and rays. You will use these figures to identify special pairs of lines and angles as well as apply what you will learn about line relationships and angle measure to classify triangles and quadrilaterals. You will also be able to determine how two triangles are congruent by identifying corresponding parts of polygons. You will use your knowledge of proportions to create and interpret circle graphs. Finally, you will be introduced to the study of translations, reflections, and rotations of geometric figures.

Lessons

1. Intro. to Geometry: Points, Lines, and Planes: 1
2. Intro. to Geometry: Points, Lines, and Planes: 2
3. Angle Relationships and Parallel Lines: 1
4. Angle Relationships and Parallel Lines: 2
5. Classifying Polygons
6. Draw a Diagram
7. Congruence
8. Circles
9. Constructions: 1
10. Constructions: 2
11. Translations
12. Symmetry and Reflections
13. Rotations
14. Review
15. Unit Test

Unit 3: Area and Volume

In this unit, you will learn how to find the areas of parallelograms, triangles, trapezoids, and circles using formulas. You will determine the surface areas of prisms, cylinders, pyramids, cones, and spheres. You will calculate the volume of prisms and cylinders. You will also use these formulas to determine the areas of irregular shapes. Finally, you will learn about space figures and how to identify them using a net.

Lessons

1. Area: Parallelograms
2. Area: Triangles and Trapezoids
3. Area: Circles: 1
4. Area: Circles: 2
5. Space Figures
6. Surface Area: Prisms and Cylinders: 1
7. Surface Area: Prisms and Cylinders: 2
8. Surface Area: Pyramids, Cones, and Spheres
9. Volume: Prisms and Cylinders
10. Make a Model
11. Volume: Pyramids, Cones, and Spheres
12. Review
13. Unit Test

Unit 4: Right Triangles in Algebra

In this unit, you will expand your knowledge of algebra by finding square roots and classifying real numbers as either rational or irrational. You will use the Pythagorean Theorem to calculate the missing sides of right triangles, the Distance Formula to find the distance between two points, and the Midpoint Formula to find the midpoint of a segment. Then, you will learn about the special relationships that exist between the sides of 45° - 45° - 90° and 30° - 60° - 90° triangles. You will also solve problems that can be modeled with similar figures by using your knowledge of proportions. Finally, you will learn the trigonometric ratios sine, cosine, and tangent, as well as the angles of elevation and depression to find the missing values of right triangles.

Lessons

1. Square Roots and Irrational Numbers
2. The Pythagorean Theorem: 1
3. The Pythagorean Theorem: 2
4. Distance and Midpoint Formulas
5. Write a Proportion
6. Special Right Triangles
7. Sine, Cosine, and Tangent Ratios
8. Angles of Elevation and Depression
9. Review
10. Unit Test

Unit 5: Data Analysis and Probability

In this unit, you will learn how to display data in many different forms. You will create frequency tables, line plots, box-and-whisker plots, and stem-and-leaf plots. You will analyze persuasive graphs to determine if and how the data being presented is misleading. You will learn the differences between theoretical and experimental probabilities, and calculate the probabilities for independent and dependent events. You will also evaluate various sampling plans for surveys, as well as estimate data about populations. Finally, you will learn the differences between permutations and combinations and how to solve a problem by simulating the problem.

Lessons

1. Frequency Tables and Line Plots
2. Box-and-Whisker Plots: 1
3. Box-and-Whisker Plots: 2
4. Using Graphs to Persuade
5. Counting Outcomes and Theoretical Probability: 1
6. Counting Outcomes and Theoretical Probability: 2
7. Independent and Dependent Events
8. Permutations and Combinations: 1
9. Permutations and Combinations: 2
10. Experimental Probability
11. Random Samples and Surveys
12. Simulate the Problem
13. Review
14. Unit Test

Unit 6: Nonlinear Functions and Polynomials

In this unit, you will explore the differences between arithmetic and geometric sequences and use them to make predictions. You will graph nonlinear functions such as quadratic and absolute value functions, and model exponential growth and decay using tables, rulers, and graphs. You will learn how to identify, evaluate, add, and subtract polynomials using models and combining like terms. Finally, you will multiply two binomials using the Distributive Property, and write a polynomial as the product of a monomial (GCF) and a polynomial.

Lessons

1. Patterns and Sequences: 1
2. Patterns and Sequences: 2
3. Graphing Nonlinear Functions
4. Exponential Growth and Decay
5. Polynomials

6. Adding and Subtracting Polynomials
7. Multiplying a Polynomial by a Monomial
8. Multiplying Binomials
9. Use Multiple Strategies
10. Review
11. Unit Test

Unit 7: Pre-Algebra 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. Pre-Algebra B Final Review
2. Pre-Algebra B Final

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