Introduction to Algebra

Welcome to the world of algebra! This workbook is designed to introduce you to the basics of algebra and variables. Algebra is a branch of mathematics that deals with variables and their relationships. It is a fundamental subject that is used in many areas of life, including science, technology, engineering, and mathematics (STEM).

What are Variables?

Variables are letters or symbols that represent unknown values or quantities that can change. In algebra, variables are used to express mathematical relationships and solve equations. Understanding variables is essential in algebra, as it allows you to model real-world situations, make predictions, and optimize outcomes.

Expressing Mathematical Relationships

Algebraic expressions are combinations of variables, constants, and mathematical operations. They are used to express mathematical relationships between variables. For example, the expression 2x + 3 represents the sum of 2 times the variable x and the constant 3.

Solving Simple Equations

Equations are statements that say two expressions are equal. Solving equations involves finding the value of the variable that makes the equation true. For example, the equation 2x + 3 = 5 can be solved by subtracting 3 from both sides and then dividing both sides by 2, resulting in x = 1.

Activity 1: Variable Scavenger Hunt

Find and record at least five examples of variables used in everyday life. Explain why each example represents a variable and how it is used in the context.

Activity 2: Simplifying Expressions

Simplify the following expressions:

1. 2x + 3 - x
2. 4x - 2 + 2x

Activity 3: Solving Equations

Solve the following equations:

1. x + 2 = 7
2. 2x - 3 = 5

Activity 4: Graphing

Graph the following equation on a coordinate plane: y = 2x + 1

Activity 5: Word Problems

Solve the following word problems:

1. Tom has $15 to spend on tickets to a concert. If each ticket costs $3, how many tickets can he buy?
2. A bakery sells 250 loaves of bread per day. If each loaf costs $2, how much money does the bakery make in a day?

Answers

Check your answers with the following solutions:

1. Tom can buy 5 tickets
2. The bakery makes $500 per day

Conclusion

Congratulations on completing this introduction to algebra basics and variables! You have learned the fundamentals of algebra and how to express mathematical relationships using variables. You have also practiced solving simple equations and graphing. Remember that algebra is a powerful tool that is used in many areas of life. Keep practicing and soon you will become proficient in algebra!

Glossary

Review the following key terms:

- Variable: a letter or symbol that represents an unknown value or quantity that can change
- Algebraic expression: a combination of variables, constants, and mathematical operations
- Equation: a statement that says two expressions are equal
- Solve: to find the value of the variable that makes the equation true

Further Learning

For more practice and to learn more about algebra, try the following resources:

- Khan Academy: Algebra Course
- Mathway: Algebra Problem Solver
- Desmos: Graphing Calculator

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