

Welcome to Algebra!

Algebra is a branch of mathematics that deals with variables and their relationships. In this introduction, we will explore the basics of algebraic expressions and variables.

Algebraic expressions are combinations of variables, constants, and mathematical operations. They can be simple, like $2x$, or more complex, like $3x + 2y$.

What are Algebraic Expressions?

An algebraic expression is a combination of variables, constants, and mathematical operations.

- Variables are letters or symbols that represent unknown values.
- Constants are numbers that do not change.
- Mathematical operations are actions performed on the variables and constants, such as addition, subtraction, multiplication, and division.

What are Variables?

Variables are letters or symbols that represent unknown values.

Variables can take on different values, and we use them to solve equations and inequalities.

Simplifying Algebraic Expressions

To simplify an algebraic expression, we combine like terms.

Like terms are terms that have the same variable raised to the same power.

Activity 1: Simplify the Expressions

Simplify the following expressions:

1. $2x + 2x$
2. $3y - 2y$
3. $2z + z$

Answer Key

Check your answers:

1. $4x$
2. y
3. $3z$

Evaluating Algebraic Expressions

To evaluate an algebraic expression, we substitute a value for the variable.

For example, evaluate the expression $2x + 3$ when $x = 4$.

Activity 2: Evaluate the Expressions

Evaluate the following expressions:

1. $2x + 2$ when $x = 3$
2. $3y - 1$ when $y = 2$
3. $x + 1$ when $x = 5$

Answer Key

Check your answers:

1. $2(3) + 2 = 6 + 2 = 8$
2. $3(2) - 1 = 6 - 1 = 5$
3. $5 + 1 = 6$

Writing Algebraic Expressions

We can write algebraic expressions to represent real-world situations.

For example, the cost of renting a bike is \$5 per hour plus a \$2 fee. Write an expression to represent the cost.

Activity 3: Write Algebraic Expressions

Write an expression to represent the following situations:

1. The cost of buying x pencils at \$0.50 each.
2. The area of a rectangle with length x and width 3.
3. The cost of renting a car for x days at \$20 per day plus a \$10 fee.

Answer Key

Check your answers:

1. $0.5x$
2. $3x$
3. $20x + 10$

Conclusion

In this introduction to algebraic expressions and variables, we have learned the basics of algebra and how to simplify, evaluate, and write algebraic expressions.

We have also practiced solving problems and writing expressions to represent real-world situations.

Assessment

Complete the following tasks:

1. Simplify the expression: $2x + 3x$
2. Evaluate the expression: $x - 2$ when $x = 5$
3. Write an expression to represent the cost of buying x books at \$10 each.

Answer Key

Check your answers:

1. $5x$
2. 3
3. $10x$

Extension Activity

Create a word problem that involves writing an algebraic expression. Solve the problem and write the expression.

