Solving Linear Equations with Real-World Applications

Introduction to Linear Equations

Welcome to the world of linear equations! In this pack, we will explore the concept of linear equations and their real-world applications. Linear equations are a fundamental concept in mathematics, and they have numerous applications in various fields such as science, economics, and engineering.

What are Linear Equations?

A linear equation is an equation in which the highest power of the variable is 1. It can be written in the form of ax + b = c, where a, b, and c are constants, and x is the variable.

Real-World Applications

Linear equations have numerous real-world applications. They can be used to model population growth, calculate costs, and make informed decisions. For example, a company can use linear equations to determine the cost of producing a product, or a scientist can use linear equations to model the growth of a population.

Activity 1: Solving Linear Equations

Solve the following linear equations:

1. $2x + 3 = 7$
2. $x - 2 = 5$
3. $4x = 20$

Activity 2: Real-World Scenarios

Read the following scenarios and solve the linear equations:

1. A bakery sells 250 loaves of bread per day. If each loaf costs $2, how much money does the bakery make in a day?
2. A car rental company charges a base fee of $20 plus an additional $0.25 per mile. If a customer rents a car for a day and drives 100 miles, how much will they be charged?
3. A scientist is studying the growth of a population of bacteria. The population grows according to the equation P(t) = 2t^2 + 5t + 1, where P is the population size and t is time in hours. If the initial population size is 10, how many bacteria will there be after 5 hours?

Activity 3: Graphing Linear Equations

Graph the following linear equations:

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

Activity 4: Word Problems

Solve the following word problems:

1. Tom has $120 to spend on tickets to a concert. If each ticket costs $15, how many tickets can he buy?
2. A company is planning to manufacture a new product. The cost of production is $10 per unit, and the company plans to sell each unit for $15. If the company produces 1000 units, how much profit will they make?
3. A city is planning to build a new highway. The cost of construction is $100,000 per mile, and the city plans to build a 10-mile highway. If the city has a budget of $1,000,000, how much money will they have left over after completing the project?

Conclusion

In this pack, we have explored the concept of linear equations and their real-world applications. We have solved linear equations, graphed linear equations, and applied linear equations to real-world scenarios. Remember, linear equations are a fundamental concept in mathematics, and they have numerous applications in various fields.

Glossary

Here are some key terms related to linear equations:

- Linear equation: an equation in which the highest power of the variable is 1
- Variable: a letter or symbol that represents a value that can change
- Constant: a value that does not change
- Coefficient: a number that multiplies a variable
- Slope: a measure of the steepness of a line
- Intercept: the point at which a line crosses the x-axis or y-axis

Assessment

Answer key: