PLANIT TEACHERS

Solving Linear Equations with Addition and Subtraction

Student Name: _____

Class: _____

Due Date: _____

Introduction to Linear Equations

What are Linear Equations?

A linear equation is an equation in which the highest power of the variable(s) is 1. For example, $2x + 3 = 5$ is a linear equation. Linear equations can be solved using addition, subtraction, multiplication, and division.

Example 1: Solve for x

$x + 2 = 7$

To solve for x, subtract 2 from both sides of the equation:

$x + 2 - 2 = 7 - 2$

$x = 5$

Solving Linear Equations with Addition

Exercise 1: Solve for x

1. x + 1 = 9
2. x + 3 = 11
3. x + 2 = 9

How to Solve Linear Equations with Addition

To solve a linear equation with addition, you need to isolate the variable (the letter or symbol that represents the unknown value). You can do this by adding or subtracting the same value to both sides of the equation.

Solving Linear Equations with Subtraction

Exercise 2: Solve for x

1. x - 2 = 5
2. x - 1 = 4
3. x - 4 = 2

How to Solve Linear Equations with Subtraction

To solve a linear equation with subtraction, you need to isolate the variable (the letter or symbol that represents the unknown value). You can do this by adding or subtracting the same value to both sides of the equation.

Exercise 3: Solve for x

1. 2x + 1 = 9
2. x - 2 = 7
3. x + 4 = 11

Mixed Exercises

These exercises will test your understanding of solving linear equations with addition and subtraction. Make sure to read each question carefully and use the correct method to solve for x.

Exercise 4: Solve the Word Problem

Tom has $15 more than his sister. If his sister has $20, how much money does Tom have?

Let x be the amount of money Tom has. Write an equation to represent the situation and solve for x.

Word Problems

Word problems will test your ability to apply linear equations to real-life situations. Make sure to read each question carefully and use the correct method to solve for x.

Conclusion

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Congratulations! You have completed this worksheet on solving linear equations with addition and subtraction. Remember to always check your solutions by plugging them back into the original equation. Practice makes perfect, so be sure to try more exercises on your own.

Additional Resources

For more practice and review, you can use online resources such as Khan Academy or Mathway. You can also ask your teacher or tutor for help if you need additional support.

Glossary

Glossary

* **Linear equation**: An equation in which the highest power of the variable(s) is 1.

* **Variable**: A letter or symbol that represents the unknown value.

* **Constant**: A value that does not change.

* **Coefficient**: A number that is multiplied by a variable.

Advanced Concepts

In this section, we will explore more advanced concepts related to linear equations. We will discuss how to solve linear equations with fractions, decimals, and variables on both sides of the equation.

Exercise 5: Solve for x

1. 1/2x + 3 = 5
2. 0.5x - 2 = 1
3. 2x + 1 = x + 4

How to Solve Linear Equations with Fractions

To solve a linear equation with fractions, you need to eliminate the fractions by multiplying both sides of the equation by the least common multiple (LCM) of the denominators.

Linear equations have many real-world applications in fields such as physics, engineering, economics, and computer science. In this section, we will explore some examples of how linear equations are used in real-world scenarios.

Case Study: Cost-Benefit Analysis

A company is considering two different production methods for a new product. Method A costs $100 per unit to produce and sells for $150 per unit, while Method B costs $120 per unit to produce and sells for $180 per unit. If the company wants to make a profit of at least $50 per unit, which method should they choose?

How to Use Linear Equations in Real-World Applications

Linear equations can be used to model real-world scenarios by representing the relationships between variables. By solving the equation, you can find the optimal solution to a problem.
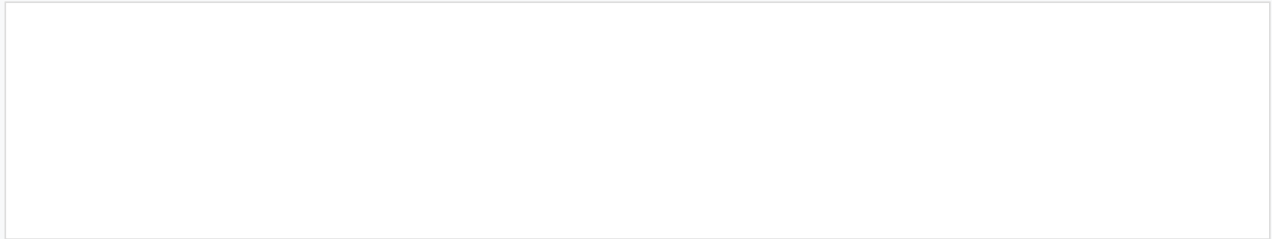
Graphing Linear Equations

Graphing linear equations is an important skill in mathematics and science. In this section, we will learn how to graph linear equations using the slope-intercept form and the standard form.

Exercise 6: Graph the Equation

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

How to Graph Linear Equations

To graph a linear equation, you need to find the x-intercept and the y-intercept, and then use the slope to draw the line.

Systems of Linear Equations

A system of linear equations is a set of two or more linear equations that have the same variables. In this section, we will learn how to solve systems of linear equations using the substitution method and the elimination method.

Exercise 7: Solve the System

1. $2x + 3y = 7$
2. $x - 2y = -3$

How to Solve Systems of Linear Equations

To solve a system of linear equations, you need to find the values of the variables that satisfy both equations. You can use the substitution method or the elimination method to solve the system.

Inequalities

Inequalities are statements that compare two expressions using the symbols <, >, ≤, or ≥. In this section, we will learn how to solve linear inequalities and graph them on a number line.

Exercise 8: Solve the Inequality

1. $2x + 1 > 5$
2. $x - 2 \leq 3$

How to Solve Linear Inequalities

To solve a linear inequality, you need to isolate the variable and then graph the solution on a number line.

Review and Assessment

In this final section, we will review the key concepts and skills learned in this unit. You will have the opportunity to assess your understanding and identify areas where you need more practice.

Exercise 9: Review

1. Solve the equation: $2x + 1 = 7$
2. Graph the equation: $y = -2x + 3$
3. Solve the system: $x + y = 4$, $2x - 2y = -2$

Review and Assessment

Take the time to review the key concepts and skills learned in this unit. Use the exercises and tasks to assess your understanding and identify areas where you need more practice.

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Exercise 2: Solve for x

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How to Solve Linear Equations with Subtraction

To solve a linear equation with subtraction, you need to isolate the variable (the letter or symbol that represents the unknown value). You can do this by adding or subtracting the same value to both sides of the equation.

Exercise 3: Solve for x

1. $2x + 1 = 9$
2. $x - 2 = 7$
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Well done on completing your homework children!