

One Girl Has 9 Cents Less Than Another Girl . They Have 29cents Between Them How Much Does Each Girl

One Girl Has 9 Cents Less Than Another Girl. They Have 29 Cents Between Them. How Much Does Each Girl?

Understanding basic algebra problems involving money can sometimes be challenging, especially when the problem involves multiple steps and subtle differences. In this article, we will explore a common word problem: "One girl has 9 cents less than another girl. They have 29 cents between them. How much does each girl have?" We will break down the problem, provide step-by-step solutions, and offer tips to solve similar problems efficiently. Whether you're a student preparing for exams or simply interested in sharpening your problem-solving skills, this comprehensive guide will help you master this type of algebraic puzzle.

Understanding the Problem

Before jumping into the solution, let's carefully analyze what the problem states:

- Difference in amount: One girl has 9 cents less than the other girl.
- Total combined amount: The sum of both girls' money is 29 cents.
- Goal: Find out how much money each girl has.

This problem involves two key variables, which we will assign in our algebraic equations:

- Let x be the amount of money the girl with more money has.
- Since one girl has 9 cents less, the other girl has $x - 9$ cents.

Our task is to find the value of x and $x - 9$.

Step-by-Step Solution Approach

To solve this problem, we will use algebraic methods, specifically setting up an equation based on the information provided.

Step 1: Define Variables

- Let x = amount of money girl with more cents has.
- Then, girl with less money has $x - 9$ cents.

Step 2: Write the Equation Based on Total Money

Since the total amount of money between the two girls is 29 cents:

$$x + (x - 9) = 29$$

This equation combines both amounts.

Step 3: Simplify the Equation

Combine like terms:

$$x + x - 9 = 29$$

$$2x - 9 = 29$$

Step 4: Solve for x

Add 9 to both sides:

$$2x = 29 + 9$$

$$2x = 38$$

Divide both sides by 2:

$$x = \frac{38}{2}$$

$$x = 19$$

So, the girl with more money has 19 cents.

Step 5: Find the Other Girl's Amount

Recall that the other girl has $x - 9$ cents:

$$19 - 9 = 10$$

Thus, the girl with less money has 10 cents.

Answer: How Much Does Each Girl Have?

- Girl with more money: 19 cents
- Girl with less money: 10 cents

Verification:

Check the total:

$$\backslash[19 + 10 = 29 \backslash]$$

Check the difference:

$$\backslash[19 - 10 = 9 \backslash]$$

Both conditions are satisfied, confirming our solution.

Additional Tips for Solving Similar Money Word Problems

Solving algebraic problems involving money and differences can be simplified by following these tips:

- Always define variables clearly: Assign a variable to the unknown quantity before setting up equations.
- Translate words into equations carefully: Pay attention to keywords like "less than," "more than," "between," etc.
- Check your work: Verify that your solution satisfies the original problem conditions.
- Use simple arithmetic: Break down complex problems into smaller, manageable steps.
- Practice different variations: The more problems you solve, the better you understand the process.

Common Variations of the Problem

Let's explore some similar problems to enhance your understanding:

Variation 1: Different Total Amount

Example: If one girl has 8 cents less than another girl, and their total is 40 cents, how much does each girl have?

Solution: Follow the same steps—define variables, write the equation, solve, and verify.

Variation 2: Different Difference and Total

Example: One girl has 5 cents less than another girl, and together they have 25 cents. Find their individual amounts.

Solution: Again, set variables, translate to an equation, solve, and validate.

Variation 3: Larger Differences or Totals

Example: If one girl has 15 cents less than another girl, and their total is 60 cents, what are their individual amounts?

Solution: Use the same algebraic approach for consistency.

Real-World Applications of Money Word Problems

While the problem we discussed is simple and theoretical, similar logic applies in real-life scenarios, such as:

- Distributing money among children or family members.
- Calculating shares in a financial split.
- Solving for unknown amounts in budgeting or expense sharing.
- Planning purchases and understanding differences in costs.

Understanding how to set up and solve such problems enhances financial literacy and problem-solving skills.

Conclusion

The problem of determining how much each girl has when one has 9 cents less than the other, and their total is 29 cents, is a straightforward algebraic problem once you carefully define variables and set up equations. The key steps involve:

- Assigning variables based on the problem description.
- Translating words into algebraic expressions.
- Solving the resulting equations systematically.
- Verifying the solution against the problem conditions.

By practicing similar problems and applying these strategies, you'll strengthen your ability to approach and solve various algebraic money word problems confidently. Remember, clear variable definitions, step-by-step solutions, and verification are essential components of successful problem-solving.

Keywords for SEO Optimization:

Money word problems, algebra problems with money, how to solve money difference problems, simple algebra problems, solving for unknown amounts, basic algebra tips, math word problems, share of money, total money problem, how much does each girl have, algebra for beginners, money distribution problems, difference and total problems.

Meta Description:

Learn how to solve the classic problem: "One girl has 9 cents less than another girl, and they have 29 cents between them." Follow our step-by-step guide to find out how much each girl has, with helpful tips and variations to master similar algebraic money problems.

Frequently Asked Questions

How do I find the amount each girl has if one has 9 cents less than the other and together they have 29 cents?

Let's assume the amount the first girl has is x cents. Since the second girl has 9 cents less, she has $x - 9$ cents. Their combined total is $x + (x - 9) = 29$. Solving for x : $2x - 9 = 29 \rightarrow 2x = 38 \rightarrow x = 19$. So, the first girl has 19 cents, and the second girl has $19 - 9 = 10$ cents.

What is the step-by-step solution to find how much each girl has in this problem?

Step 1: Let the amount the first girl has be x cents. Step 2: The second girl has $x - 9$ cents. Step 3: Set up the equation: $x + (x - 9) = 29$. Step 4: Simplify: $2x - 9 = 29$. Step 5: Add 9 to both sides: $2x = 38$. Step 6: Divide both sides by 2: $x = 19$. Step 7: Find the second girl's amount: $19 - 9 = 10$ cents. So, the first girl has 19 cents, and the second girl has 10 cents.

If one girl has 9 cents less than another and they have 29 cents between them, how much does the girl with more money have?

The girl with more money has 19 cents. First, find the amount the girl with less money has, which is 10 cents, and then add 9 cents to find the larger amount: $10 + 9 = 19$ cents.

Can this problem be solved using algebra? How?

Yes. Assign a variable to the amount one girl has, set up an equation based on the total sum, and solve for that variable. For example, if x is the amount of the girl with more money, then the other girl has $x - 9$, and together they sum to 29: $x + (x - 9) = 29$. Solving this gives the amounts each girl has.

What real-life situations can this type of problem apply to?

This type of problem applies to situations like splitting money, sharing items with a difference, or dividing resources where one person has slightly less than another, such as in budgeting, shopping, or dividing supplies.

What is an easy way to check if the solution to this problem is correct?

Add the two amounts you found for each girl and see if they total 29 cents. Also, check if the difference between their amounts is 9 cents. For our solution, $19 + 10 = 29$ and $19 - 10 = 9$, which confirms the solution is correct.

Additional Resources

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Introduction

In the world of basic mathematics, word problems often serve as vital tools to develop critical thinking and problem-solving skills. These problems, while seemingly simple, challenge individuals to translate real-world scenarios into algebraic expressions and equations. One such problem that has intrigued students and educators alike is: "One girl has 9 cents less than another girl. They have 29 cents between them. How much does each girl have?" This question not only tests understanding of basic addition and subtraction but also emphasizes the importance of setting up correct equations to find solutions. In this article, we will explore this problem in depth, dissecting each part of the question, constructing the appropriate mathematical models, and solving systematically to arrive at the accurate answer. Whether you're a student brushing up on algebra or a teacher seeking to clarify problem-solving strategies, this guide aims to deliver a comprehensive, reader-friendly explanation of this classic coin problem.

Understanding the Problem

Before diving into calculations, it's crucial to interpret the problem carefully. The key details are:

- One girl has 9 cents less than another girl.
- The total amount of money both girls have combined is 29 cents.

These statements set the stage for defining variables and constructing equations. The problem involves two quantities (the amounts each girl has) and their relationship (one girl has 9 cents less). Recognizing these relationships is the first step toward solving the problem correctly.

Defining Variables

To translate the word problem into mathematical language, we assign variables:

- Let x = the amount of money (in cents) that the richer girl has.
- Since the other girl has 9 cents less, her amount will be $x - 9$.

This approach simplifies the problem into an algebraic framework, allowing us to work with equations rather than words.

Formulating the Equation

Knowing the total sum of their money is 29 cents, we can set up an equation:

$$\text{Girl 1's money} + \text{Girl 2's money} = 29$$

Using the variables:

$$x + (x - 9) = 29$$

This key equation captures the entire scenario. It states that the sum of the amounts both girls have is 29 cents, with the second girl always having 9 cents less than the first.

Solving the Equation

Let's now solve for x step by step:

1. Combine like terms:

$$\begin{aligned} x + x - 9 &= 29 \\ 2x - 9 &= 29 \end{aligned}$$

2. Add 9 to both sides to isolate the term with x :

$$\begin{aligned} 2x &= 29 + 9 \\ 2x &= 38 \end{aligned}$$

3. Divide both sides by 2:

$$\begin{aligned} x &= \frac{38}{2} \\ x &= 19 \end{aligned}$$

So, the richer girl has 19 cents.

4. To find the other girl's amount:

$$x - 9 = 19 - 9 = 10$$

The other girl has 10 cents.

Verifying the Solution

It's always good practice to verify that the solution fits the original problem:

- The difference between their amounts:

$19 - 10 = 9$ \text{ cents} \] – matches the "9 cents less" condition.

- The total:

$19 + 10 = 29$ \text{ cents} \] – matches the total sum.

Since both conditions are satisfied, the solution is correct.

Interpreting the Results

From the calculations, we conclude:

- Girl 1 (the richer girl) has 19 cents.
- Girl 2 has 10 cents.

This straightforward approach demonstrates how defining variables and constructing an equation based on the problem's conditions can lead to an effective solution.

Additional Insights and Variations

While this problem is specific, the approach can be generalized to a variety of similar word problems involving differences and totals:

- Different difference amounts: If the difference were 15 cents instead of 9, the same process applies.
- Different totals: If the total sum changes, the same method applies with adjusted equations.
- Multiple entities: Problems involving more than two people can often be approached with systems of equations.

Understanding the core principles—defining variables, translating words into equations, solving systematically—empowers problem solvers to handle a wide range of algebraic challenges.

Conclusion

The problem of determining how much each girl has when one has 9 cents less than another and their combined total is 29 cents is a classic example of applying simple algebra to real-world scenarios. By carefully defining variables, formulating the appropriate equation, and solving systematically, we find that one girl has 19 cents while the other has 10 cents. This exercise underscores the importance of clear problem interpretation, precise algebraic modeling, and verification of solutions. Mastering such problems builds foundational skills that are essential not only in mathematics but also in everyday reasoning and decision-making.

In summary:

- Assign variables based on the problem's conditions.
- Construct an equation reflecting the total and difference.
- Solve algebraically to find each girl's amount.
- Verify that the solution satisfies the original problem.

With these strategies, tackling similar word problems becomes an accessible and engaging process, fostering confidence and mathematical literacy in learners of all ages.

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