

two step equation word problems answers key with work

Two step equation word problems answers key with work can be essential for students who are learning algebra. Understanding how to solve these types of problems not only aids in grasping mathematical concepts but also improves critical thinking and problem-solving skills. In this article, we will delve deep into the world of two-step equations, provide detailed word problem examples, and present the answers with step-by-step solutions.

Understanding Two-Step Equations

Two-step equations are algebraic equations that require two operations to isolate the variable. Typically, they take the form:

$$ax + b = c$$

Where a , b , and c are constants, and x is the variable we need to solve for. The solution involves the following steps:

1. Eliminate the constant term by performing the inverse operation.
2. Isolate the variable by dividing or multiplying, as needed.

Common Operations in Two-Step Equations

The two main operations involved in solving these equations are:

- Addition or Subtraction
- Multiplication or Division

This structure becomes particularly useful when applied to real-world word problems.

Examples of Two-Step Equation Word Problems

To illustrate how to tackle these equations, let's consider some examples.

Example 1: The Price of Apples

Problem Statement:

Sarah bought 5 apples and paid a total of \$4. If each apple costs the same amount, how much does each apple cost?

Formulating the Equation:

Let (x) be the cost of one apple. The equation can be set up as:

$$5x = 4$$

Step 1: Isolate the variable term.

To isolate (x) , divide both sides by 5:

$$x = \frac{4}{5}$$

Step 2: Solve for x .

Calculating gives:

$$x = 0.8$$

Answer:

Each apple costs \$0.80.

Example 2: The Book Club

Problem Statement:

Jane is organizing a book club and has 30 books. She wants to distribute them among her friends such that each friend receives 2 books, and she keeps 6 books for herself. How many friends can she give books to?

Formulating the Equation:

Let (x) be the number of friends. The equation can be set up as:

$$2x + 6 = 30$$

Step 1: Subtract the constant.

Subtract 6 from both sides:

$$2x = 30 - 6$$

$$2x = 24$$

Step 2: Divide by 2.

Now, divide both sides by 2:

$$x = \frac{24}{2}$$

$$x = 12$$

Answer:

Jane can give books to 12 friends.

Example 3: The Movie Tickets

Problem Statement:

Tom and his friends went to the movies. Tom bought 3 tickets, and they spent a total of \$24. How much does each ticket cost?

Formulating the Equation:

Let x be the cost of one ticket. The equation can be set up as:

$$3x = 24$$

Step 1: Isolate the variable.

Divide both sides by 3:

$$x = \frac{24}{3}$$

$$x = 8$$

Answer:

Each ticket costs \$8.

Creating More Word Problems

To ensure a thorough understanding of two-step equations, it can be beneficial to create additional word problems. Here are some more scenarios:

- Example 4: The School Fundraiser

A school is raising money by selling cookies. If they sold 150 cookies and earned \$300, how much money did they make per cookie?

Equation:

$$150x = 300$$

- Example 5: The Concert Tickets

Lisa bought 4 concert tickets and spent \$160. How much did each ticket cost?

Equation:

$$4x = 160$$

- Example 6: Building a Fence

A gardener is building a fence around her garden. If she has 20 meters of fencing and uses 5 meters for the entrance, how much fencing will she use for the rest of the garden?

Equation:

$$x + 5 = 20$$

For each scenario, the steps to solve would be similar to the previously discussed examples, applying the same operations to isolate the variable.

Tips for Solving Two-Step Equations

Here are some helpful tips to keep in mind when solving two-step equations from word problems:

1. Identify the Variable:

Determine what you need to solve for and assign a variable to it.

2. Translate the Problem:

Convert the words into an algebraic equation. Look for keywords that indicate operations (e.g., "total," "less than," "more than").

3. Perform Inverse Operations:

Always remember to perform the inverse operation to isolate the variable.

4. Check Your Work:

After finding a solution, plug it back into the original equation to ensure it satisfies the equation.

5. Practice Regularly:

The more problems you solve, the better you will understand the process.

Conclusion

In conclusion, mastering two step equation word problems answers key with work is a fundamental skill in algebra. Through practice and application of the steps outlined in this article, students can develop confidence in their problem-solving abilities. By approaching word problems methodically and translating them into mathematical equations, students can solve complex problems with ease. Regular practice and application will lead to proficiency and a deeper understanding of algebraic concepts, paving the way for future mathematical success.

Frequently Asked Questions

What is a two-step equation word problem?

A two-step equation word problem is a mathematical problem that requires you to form a two-step equation based on a real-life scenario, and then solve it to find the unknown variable.

How do you identify the variable in a two-step equation word problem?

To identify the variable, read the problem carefully and look for the quantity that is unknown and needs to be found, often represented by a letter like x .

What are the common operations used in two-step equations?

The common operations used in two-step equations include addition, subtraction, multiplication, and division.

Can you provide an example of a two-step equation word problem?

Sure! For example: 'Maria has twice as many apples as Tom. If the total number of apples they have is 18, how many apples does Tom have?' This can be expressed as $2x + x = 18$.

What is the first step in solving a two-step equation?

The first step is to isolate the term with the variable by performing the inverse operation of addition or subtraction on both sides of the equation.

How do you check your answer after solving a two-step equation?

To check your answer, substitute the value of the variable back into the original equation to see if both sides are equal.

What strategies can help in solving two-step equation word problems?

Some helpful strategies include highlighting key information, writing down the equation, breaking the problem into smaller steps, and double-checking your calculations.

Are there any online resources for practicing two-step equation word problems?

Yes, there are many online resources available such as Khan Academy, IXL, and various math tutoring websites that offer practice problems and step-by-step solutions.

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