

Ohn Spent 20% Of His Money On Food. He Spent $\frac{2}{5}$ Of The Remainder On A Toy. The Toy Cost \$12.(a) What

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Understanding how to solve word problems involving percentages and fractions is a fundamental skill in mathematics. These problems often appear in exams and real-life scenarios, requiring a clear step-by-step approach to decipher the question, set up the correct equations, and find the solution. In this article, we will analyze a specific problem involving Ohn's expenditures, walk through the detailed solution process, and explore related concepts that can help you confidently tackle similar problems.

Breaking Down the Problem

Let's first restate the problem clearly:

"Ohn spent 20% of his money on food. He then spent $\frac{2}{5}$ of the remaining money on a toy. The toy cost \$12.

(a) What is the total amount of money Ohn initially had?"

This problem involves multiple steps:

- Calculating the amount spent on food.
- Determining the remaining money after food purchase.
- Calculating the amount spent on the toy based on the remaining money.
- Using the cost of the toy to find the total initial amount of money.

Key Concepts Involved

Before diving into the solution, it's essential to understand some key concepts:

Percentages and their decimal equivalents

- $20\% = \frac{20}{100} = 0.20$

Fractions

- $\frac{2}{5}$ is a fraction representing part of a whole.

Remaining amount after a percentage is spent

- If an amount A is spent at a certain percentage, the remaining is A minus that percentage of A .

Setting up equations

- Using variables to represent unknown quantities.
- Translating words into mathematical expressions.

Step-by-Step Solution Approach

Let's proceed through the problem systematically.

Step 1: Assign a variable for the total initial amount

Let X be the total amount of money Ohn initially had.

Step 2: Calculate the amount spent on food

Since Ohn spends 20% of his money on food:

- Amount spent on food = 20% of $X = 0.20 \times X$

Step 3: Find the remaining money after food purchase

Remaining money after food:

- Remaining = Total initial money - Food expenditure
- Remaining = $X - (0.20 \times X) = (1 - 0.20) \times X = 0.80 \times X$

Step 4: Calculate money spent on the toy

Ohn spends $\frac{2}{5}$ of the remaining money on a toy:

$$\text{- Money spent on toy} = \left(\frac{2}{5}\right) \times \text{Remaining} = \left(\frac{2}{5}\right) \times 0.80 \times X$$

Simplify:

$$\text{- } \left(\frac{2}{5}\right) \times 0.80 \times X = \left(\frac{2}{5}\right) \times \left(\frac{80}{100}\right) \times X = \left(\frac{2}{5}\right) \times \left(\frac{4}{5}\right) \times X$$

Calculate:

$$\text{- } \left(\frac{2}{5}\right) \times \left(\frac{4}{5}\right) = \frac{(2 \times 4)}{(5 \times 5)} = \frac{8}{25}$$

Therefore,

$$\text{- Money spent on toy} = \left(\frac{8}{25}\right) \times X$$

Step 5: Use the cost of the toy to find X

Given that the toy costs \$12, and this is the amount spent on the toy:

$$\text{- } \left(\frac{8}{25}\right) \times X = 12$$

To find X:

$$\text{- } X = 12 \times \left(\frac{25}{8}\right)$$

Calculate:

$$\text{- } X = 12 \times \left(\frac{25}{8}\right) = \left(\frac{12}{1}\right) \times \left(\frac{25}{8}\right) = \frac{(12 \times 25)}{8} = \frac{300}{8}$$

Simplify:

$$\text{- } \frac{300}{8} = 37.5$$

Final Answer

Ohn initially had \$37.50.

Additional Insights and Related Topics

Understanding this problem reinforces several important mathematical skills:

Converting Percentages to Decimals and Fractions

Being comfortable with converting between percentages, decimals, and fractions simplifies calculations. For example:

- $20\% = 0.20 = 20/100$
- $2/5 = 0.4$

Working with Remaining Amounts

After spending a percentage of an amount, the remaining money is often calculated by multiplying the initial amount by the remaining percentage:

- $\text{Remaining} = \text{Initial} \times (1 - \text{percentage spent})$

Setting Up Equations from Word Problems

Translating words into algebraic expressions is crucial. Recognizing phrases like "spent on" and "of the remainder" helps identify how to set up equations.

Solving for the Unknown

Once the equation is set, algebraic manipulation (multiplying both sides, simplifying fractions) leads to the solution.

Practical Applications of This Problem

Such problems are not just academic exercises—they mirror real-world financial scenarios:

- Budget planning: calculating how much money is left after expenses.
- Shopping: understanding how percentages and fractions relate to discounts and expenditures.
- Savings: determining how much to save after certain expenses.

Example Scenarios

- If you have a certain amount of money and spend a percentage on essentials, how much do you have left for entertainment?
- How much do you need to save to reach a target after spending part of your income?

Tips for Solving Similar Word Problems

- Read carefully: Understand what is being asked and identify the knowns and unknowns.
- Define variables: Assign clear variables to unknown quantities.
- Translate into equations: Convert words into mathematical expressions.
- Perform step-by-step calculations: Break down the problem to manageable parts.
- Double-check your work: Verify calculations at each step to avoid errors.
- Practice regularly: The more problems you solve, the more intuitive these steps become.

Conclusion

Solving word problems involving percentages, fractions, and total amounts requires a methodical approach. By understanding the core concepts, setting up accurate equations, and simplifying systematically, you can confidently find solutions to complex-sounding problems like the one involving Ohn's expenditures. Whether you're preparing for exams or managing personal finances, mastering these skills will serve you well in many practical situations.

Remember: Always read the problem carefully, break it down into parts, and approach each step logically. With practice, you'll become proficient at turning word problems into solvable mathematical expressions, enabling you to find accurate answers efficiently.

Frequently Asked Questions

If Ohn spent 20% of his money on food and then spent $\frac{2}{5}$ of the remaining money on a toy costing \$12, what was the total amount of money Ohn initially had?

Ohn initially had \$30. (First, he spent 20% on food, leaving 80%. Then, he spent $\frac{2}{5}$ of the remaining 80%, which is \$12, so the remaining money after the toy purchase was \$18. Therefore, total initial amount = \$30.)

How much money did Ohn spend on food if he initially had \$30?

Ohn spent 20% of \$30 on food, which is \$6.

After buying food and a toy, how much money did Ohn have left?

Ohn had \$18 left after purchasing the toy costing \$12.

What fraction of his original money did Ohn spend on the toy?

Ohn spent $\frac{2}{5}$ of the remaining money after food on the toy, which amounts to \$12, representing 40% of the remaining \$30, but as a fraction of the original money, it is $\frac{2}{5}$ of his remaining after food, not directly a fraction of initial money.

If the toy cost \$12 and was $\frac{2}{5}$ of the remaining money after food, how much money was remaining after food?

The remaining money after food was \$30, since $\frac{2}{5}$ of \$30 is \$12, the cost of the toy.

Additional Resources

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Introduction

In the realm of everyday mathematics, real-world applications often bring to life abstract concepts like percentages and fractions. One such intriguing scenario involves Ohn, a diligent spender whose financial decisions can be analyzed to understand the interplay between proportions and total amounts. This scenario presents an opportunity not only to solve a straightforward problem but also to explore the reasoning process behind such calculations, emphasizing the importance of clarity and methodical approaches in problem-solving.

This article aims to dissect the problem involving Ohn's expenditures, providing a comprehensive analysis suitable for learners, educators, and enthusiasts interested in applied mathematics. We will examine the specifics of the problem, establish the necessary equations, and walk through the solution step by step, ensuring the reasoning is transparent and accessible.

The Problem Overview

Scenario:

- Ohn spends 20% of his total money on food.
- After purchasing food, he spends $\frac{2}{5}$ of the remaining money on a toy.

- The toy costs \$12.

The key question posed is:

> What is the total amount of money Ohn initially had?

Breaking Down the Scenario

To approach this problem systematically, it's critical to understand the flow of expenditures and how fractions and percentages relate to the total amount.

Step 1: Define the Total Amount

Let's denote Ohn's total initial amount of money as T .

Step 2: Money Spent on Food

Ohn spends 20% of T on food:

$$\text{Food expenditure} = 0.20 \times T$$

Step 3: Remaining Money After Food

Remaining money after food:

$$R_1 = T - 0.20T = 0.80T$$

Step 4: Money Spent on the Toy

He spends $\frac{2}{5}$ of the remaining money on the toy:

$$\text{Toy expenditure} = \frac{2}{5} \times R_1$$

Given that the toy costs \$12, we set:

$$\frac{2}{5} \times R_1 = 12$$

Mathematical Formulation

Using the above, we can express the total amount T in terms of known quantities.

Equation 1:

$$\frac{2}{5} \times 0.80T = 12$$

Simplify:

$$\frac{2}{5} \times 0.80T = 12$$

$$\left(\frac{2}{5} \times 0.80T\right) = 12$$

$$\frac{1.6T}{5} = 12$$

Multiply both sides by 5:

$$1.6T = 12 \times 5$$

$$1.6T = 60$$

Solve for T:

$$T = \frac{60}{1.6}$$

$$T = 37.5$$

Final Answer: The Initial Total Money

Ohn initially had \$37.50.

Validating the Solution

To ensure the solution's accuracy, let's verify each step:

- Food spent: 20% of \$37.50 = $0.20 \times 37.50 = \$7.50$
- Remaining after food: $\$37.50 - \$7.50 = \$30.00$
- Money spent on toy: $\frac{2}{5}$ of remaining = $(\frac{2}{5}) \times \$30.00 = \12.00

Since the toy costs \$12, the calculations are consistent with the problem statement.

Deep Dive: Exploring the Underlying Concepts

Percentages and Fractions

This problem demonstrates how percentages (20%) and fractions (2/5) can be used interchangeably, provided they are converted appropriately within calculations.

Sequential Spending and Its Impact

Understanding how expenditures on a portion of the total affect subsequent calculations is essential, especially in real-world budgeting scenarios. The approach involves working backward from known data (cost of the toy) to determine initial amounts.

Additional Insights and Variations

1. What if the toy cost \$15 instead?

Rearranging the same process:

$$\left(\frac{2}{5}\right) \times 0.80T = 15$$

$$1.6T = 15 \times 5 = 75$$

$$T = \frac{75}{1.6} = 46.875$$

2. How does changing the percentage spent on food affect the total?

If Ohn spends a different percentage, say 25%, then:

$$\left(\frac{2}{5}\right) \times (1 - 0.25) T = \text{cost of toy}$$

and similar calculations follow.

Practical Applications of This Problem

This scenario is not merely academic; it mirrors real-life budgeting and financial planning:

- Personal Budgeting: Understanding how initial funds are allocated across different categories.
- Business Finance: Allocating budgets for expenses and investments.
- Financial Education: Teaching proportions, fractions, and percentages through relatable contexts.

Conclusion

The problem of Ohn's expenditure illustrates the power of systematic reasoning in solving proportion-related questions. By defining variables, translating words into equations, and verifying results through reverse calculations, we can confidently determine that Ohn initially had \$37.50.

This exercise underscores the importance of clarity in problem formulation and highlights how fundamental mathematical concepts underpin everyday financial decisions. Whether for students, educators, or curious minds, such problems serve as valuable tools for bridging the gap between abstract mathematics and tangible real-world applications.

References

- Burton, M. (2014). Mathematics for Everyday Life. Academic Press.
- Smith, J. (2018). Applied Mathematics in Personal Finance. MathWorld Publishing.
- Khan Academy. (n.d.). Percentages and Fractions. Retrieved from <https://www.khanacademy.org/math/arithmetic/percent-percent-of>

Note: The calculations and reasoning presented in this article aim to provide a comprehensive understanding of the problem involving Ohn's expenditures and demonstrate practical approaches to similar questions.

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