21.Ada Mae Bought A Pen For $1.50 And 3 DVDs That Each Cost The Same Amount. She Spent $22.50in All.

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Introduction

Mathematics is an essential part of our daily lives, helping us make sense of everyday transactions, budgeting, and problem-solving. One common scenario involves understanding how much items cost when purchasing multiple items with different prices. Today, we explore a simple yet insightful problem involving Ada Mae, who bought a pen and three DVDs, each priced the same, with a total expenditure of $22.50. This problem not only tests basic algebra skills but also offers a practical example of solving for unknowns in real-world situations.

Understanding such problems is crucial for students, educators, and anyone interested in developing their mathematical reasoning abilities. By delving into this specific scenario, we can learn how to set up equations, perform calculations, and interpret results effectively. Additionally, this problem demonstrates the usefulness of algebra in everyday shopping and budgeting, making it highly relevant for learners of all ages.

In this article, we will break down the problem step by step, providing clear explanations, formulas, and strategies to find the cost of each DVD. We will also discuss related concepts such as linear equations, basic algebraic manipulation, and real-life applications of math. Whether you're a student preparing for exams, a teacher designing lesson plans, or a curious individual wanting to sharpen your math skills, this detailed guide will serve as a valuable resource.

Understanding the Problem

What are we asked to find?

The main goal is to determine the cost of each DVD that Ada Mae purchased. Given the total amount spent and the known cost of the pen, we can set up an equation to solve for the unknown price of the DVDs.

The details provided:

- Cost of the pen = $1.50
- Number of DVDs purchased = 3
- Cost of each DVD = ? (unknown)
- Total amount spent = $22.50

Key points to consider:

- The DVDs are priced equally.
- The total amount spent includes the pen and all three DVDs.

Breaking Down the Problem

Step 1: Identify the known and unknown quantities

Quantity	Description	Value
Pen cost	Cost of one pen	$1.50
DVDs	Number of DVDs	3
Cost per DVD	Price of each DVD	? (unknown)
Total spent	Total expenditure	$22.50

Step 2: Set variables for unknowns

Let x be the price of each DVD.

Step 3: Write the equation

Total cost of DVDs = 3 × x

Total expenditure = cost of pen + total cost of DVDs

Therefore,

$$
\text{Total expenditure} = \text{Pen cost} + 3 \times x
$$

Substituting the known values:

$$
22.50 = 1.50 + 3 \times x
$$

Solving the Equation

Step 1: Isolate the variable

Subtract the cost of the pen from both sides:

$$
22.50 - 1.50 = 3 \times x
$$

Calculating:

$$
21.00 = 3 \times x
$$

Step 2: Solve for x

Divide both sides by 3:

$$
x = \frac{21.00}{3} = 7.00
$$

$$

Final answer:

Each DVD costs $7.00.

Understanding the Solution

Verification

To ensure our calculation is correct, check the total:

- Cost of 3 DVDs = 3 × $7.00 = $21.00
- Add the pen: $1.50
- Total spent = $21.00 + $1.50 = $22.50

The total matches the given amount, confirming our solution is accurate.

Practical implications

Knowing the cost of each DVD helps consumers budget their expenses better. For example, if Ada Mae wanted to buy additional DVDs or other items, understanding the unit price allows for efficient planning.

Related Concepts and Applications

Algebraic equations in everyday shopping

This problem demonstrates how algebra can be used to determine unknown prices based on total costs. Such skills are useful for:

- Budget planning
- Comparing prices
- Calculating discounts
- Estimating expenses

Real-world examples

- Determining the price of multiple items when given a total bill
- Calculating the unit price of items in a store
- Splitting bills among friends
- Budgeting for gifts, groceries, or supplies

Tips for solving similar problems

- Identify known and unknown variables.
- Set up an equation based on the problem context.
- Simplify and solve systematically.
- Double-check your calculations by plugging the answer back into the original problem.

Additional Practice Problems

To reinforce understanding, consider solving these related problems:

1. If Ada Mae bought a pen for $1.50 and 2 DVDs costing the same amount, spending a total of $15, what is the price of each DVD?

2. A store sells 4 identical books along with a pen costing $2. If the total purchase is $34, what is the price of each book?

3. Jane bought 5 candies for $0.50 each and a toy costing $3. If she spent $5.50 in total, how much did the toy cost?

Conclusion

Understanding how to solve problems involving total costs and unknown item prices is an essential mathematical skill with practical applications. In the case of Ada Mae's purchase, we demonstrated how to set up and solve an algebraic equation to find the price of each DVD.

This simple yet effective approach can be applied to various scenarios, from shopping and budgeting to more complex financial calculations. Mastering these concepts enhances problem-solving abilities and builds confidence in handling everyday mathematical challenges.

Remember, the key steps involve identifying knowns and unknowns, setting up the correct equation, performing systematic calculations, and verifying your answers. With practice, you'll become proficient at tackling similar problems with ease and accuracy.

Keywords for SEO Optimization

- Math word problems
- Algebra in everyday life
- Solving for unknowns
- Budgeting and shopping math
- Calculating item prices
- Practical algebra problems
- Basic math skills
- How to find the price of items
- Real-world math applications
- Educational math resources

Frequently Asked Questions

How much did Ada Mae spend on each DVD if she bought 3 DVDs along with a pen for a total of $22.50?

First, subtract the cost of the pen ($1.50) from the total: $22.50 - $1.50 = $21. Then, divide $21 by 3 for the DVDs: $21 ÷ 3 = $7. Each DVD costs $7.

What is the total amount Ada Mae spent on the 3 DVDs?

Ada Mae spent $21 on the 3 DVDs, since each DVD costs $7 and 3 DVDs total $7 × 3 = $21.

If Ada Mae bought 4 DVDs instead of 3, how much would she have spent in total at the same prices?

Each DVD costs $7, so 4 DVDs would cost 4 × $7 = $28. Adding the pen ($1.50), total spending would be $28 + $1.50 = $29.50.

What was the cost of each DVD, given the total amount spent and the price of the pen?

The pen cost $1.50, and the total spent was $22.50. Subtracting the pen: $22.50 − $1.50 = $21. Then, dividing by 3 DVDs: $21 ÷ 3 = $7. So, each DVD costs $7.

How can you verify the total amount spent matches the sum of the pen and DVDs?

Add the cost of the pen ($1.50) to the total cost of the 3 DVDs ($7 each): $1.50 + (3 × $7) = $1.50 + $21 = $22.50, which matches the total amount spent.

Additional Resources

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Introduction

In the realm of everyday transactions, seemingly simple purchases often conceal intriguing numerical and logistical questions. The scenario involving Ada Mae, who bought a pen for $1.50 and three DVDs at the same price each, ultimately spending $22.50 in total, is a classic example of a problem that invites scrutiny from both mathematical and consumer perspective. While at first glance this may appear straightforward, a deeper investigation reveals layers of assumptions, potential errors, and real-world implications that extend beyond mere arithmetic.

This article aims to dissect the scenario thoroughly, examining the mathematics behind the purchase, exploring possible interpretations and misinterpretations, and considering the broader context of consumer behavior and retail practices.

The Basic Mathematical Breakdown

Initial Data and Assumptions

- Pen cost: $1.50

- Number of DVDs purchased: 3
- Cost per DVD: unknown, but same for each
- Total amount spent: $22.50

Given these, the fundamental equation is:

Total Cost = Cost of Pen + (Number of DVDs × Cost per DVD)

Expressed mathematically:

$22.50 = $1.50 + 3 × (Cost per DVD)

Calculating the Cost per DVD

Rearranging the equation:

3 × (Cost per DVD) = $22.50 − $1.50 = $21.00

Dividing both sides by 3:

Cost per DVD = $21.00 / 3 = $7.00

Thus, each DVD costs $7.00.

Summary:

- Pen: $1.50
- Each DVD: $7.00
- Total for DVDs: 3 × $7.00 = $21.00
- Total spent: $1.50 + $21.00 = $22.50

This aligns perfectly with the total amount spent, confirming the internal consistency of the data.

Validating the Scenario: Is It Realistic?

While the arithmetic checks out, the scenario raises questions about real-world plausibility.

1. Pricing Consistency

- Is it typical for DVDs to cost $7.00?
- Historically, DVD prices vary widely — new releases often cost more, while older titles may be cheaper.
- A $7.00 price point suggests a sale, discount, or clearance, which is plausible.

2. Consumer Behavior

- Purchasing a pen for $1.50 and three DVDs at $7.00 each indicates a mix of low-cost and moderate-cost items.
- The total expenditure of $22.50 suggests a deliberate decision, perhaps during a sale or promotion.

3. Retail Environment

- The store's pricing strategy appears to support such a transaction— perhaps a discount store or a promotional event.

Potential Confusions and Misinterpretations

Despite the clarity in the calculation, several nuances could lead to misinterpretation.

A. Misreading the Total Cost

Suppose someone misreads the total amount as $25 instead of $22.50. This would change the calculations and implications.

B. Inclusion of Additional Fees

- Are taxes or fees included?
- If taxes are added at the point of sale, the subtotal might differ, altering the per-item price calculation.

C. Assumption of Same Price for DVDs

- The scenario specifies each DVD costs the same, but in real-world retail, prices often vary.
- The uniform price assumption simplifies the problem but may not reflect actual shopping experiences.

Broader Context: Consumer Economics and Retail Pricing Strategies

Understanding this scenario extends beyond just solving an arithmetic problem. It touches on several important themes:

1. Pricing Strategies

- Retailers often employ psychological pricing, discounts, or bundling to influence consumer behavior.
- The $7.00 DVD price suggests a strategic price point, possibly a markdown from a higher original price.

2. Consumer Decision-Making

- Consumers like Ada Mae make purchasing decisions based on perceived value, costs, and promotions.
- The choice to buy a pen and DVDs together could be driven by convenience, discounts, or specific needs.

3. Cost Analysis

- From a cost perspective, the scenario exemplifies how small adjustments in item prices can significantly affect total expenditure.
- For example, if the DVD price increased to $8.00, the total would become:

$1.50 + 3 × $8.00 = $1.50 + $24.00 = $25.50

- This demonstrates the sensitivity of total cost to unit prices.

Hypothetical Variations and Their Implications

To deepen the understanding, consider alternative scenarios:

Scenario 1: Different DVD Prices

- Suppose the DVDs are priced at varying amounts; perhaps the first costs $6.50, the second $7.00, and the third $7.50.
- Then, total DVD cost: $6.50 + $7.00 + $7.50 = $21.00
- Total purchase: $1.50 + $21.00 = $22.50, consistent with original data.

Implication: The scenario remains plausible with varying prices, as long as they sum appropriately.

Scenario 2: Additional Items or Fees

- If Ada Mae also paid sales tax at 10%, then pre-tax total would be:

Pre-tax total = $22.50 / 1.10 ≈ $20.45

- The sum of the pre-tax items:

$1.50 + 3 × (DVD price) ≈ $20.45

- Solving for DVD price:

3 × DVD price = $20.45 - $1.50 ≈ $18.95

DVD price ≈ $6.32

Implication: Accounting for taxes affects the unit prices and total calculations, adding complexity to the scenario.

Critical Analysis: What Does This Tell Us?

While the initial problem seems straightforward, it offers insight into:

- The importance of precise data in financial calculations.
- How assumptions about pricing, taxes, and discounts influence total expenditure.
- The value of verifying arithmetic with contextual understanding.

It also exemplifies how small numerical details can impact broader consumer and retail strategies.

Conclusion

The scenario where Ada Mae bought a pen for $1.50 and 3 DVDs that each cost the same amount, spending $22.50 in total exemplifies the interplay between basic arithmetic and practical considerations. The calculations confirm that each DVD costs $7.00, fitting neatly into the total sum. However, real-world applications involve more variables—taxes, discounts, variable pricing, and consumer behavior—that can complicate such straightforward calculations.

This analysis demonstrates that even simple arithmetic problems can serve as valuable case studies in retail economics, consumer decision-making, and the importance of precise data. Whether for educators, students, or retail professionals, understanding these nuances enhances comprehension of everyday transactions and the underlying numerical principles.

In the end, Ada Mae’s purchase is a microcosm of the broader economic landscape—simple on the surface, yet rich with insights when examined beneath.

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