

A Television And DVD Player Cost A Total Of \$1230. The Cost Of The Television Is Two Times The Cost Of

A Television And DVD Player Cost A Total Of \$1230. The Cost Of The Television Is Two Times The Cost Of the DVD Player. This intriguing statement sets the stage for exploring how to determine individual costs based on given total and proportional relationships. Understanding such problems involves basic algebra, problem-solving skills, and practical applications in budgeting and shopping. In this article, we will delve into the details of this problem, demonstrating how to find the actual costs of both items, and discuss related concepts that can help in similar scenarios.

Understanding the Problem

Before jumping into calculations, it's essential to clearly understand what the problem states:

- The combined total cost of a television and a DVD player is \$1230.
- The cost of the television is twice the cost of the DVD player.

This problem requires us to find the individual costs of the television and the DVD player given these two facts.

Breaking Down the Information

To solve the problem systematically, we need to:

1. Define variables for the unknowns.
2. Set up an equation based on the given relationships.
3. Solve the equation to find the individual costs.

Let's explore each step in detail.

Defining Variables

Assign variables to represent the unknown quantities:

- Let x = the cost of the DVD player.
- Since the television costs twice as much as the DVD player, the cost of the television = $2x$.

Setting Up the Equation

The total cost of both items is given as \$1230. According to the problem:

$$\text{Cost of TV} + \text{Cost of DVD Player} = 1230$$

Substituting the variables:

$$2x + x = 1230$$

which simplifies to:

$$3x = 1230$$

Solving the Equation

The next step is to solve for x :

$$x = \frac{1230}{3} = 410$$

This means:

- The DVD player costs \$410.
- The television costs twice that amount:

$$2 \times 410 = 820$$

Therefore:

- Television cost = \$820
- DVD player cost = \$410

Verifying the Solution

Always verify your calculations to ensure they align with the original problem.

Sum the individual costs:

$$\begin{aligned} & \backslash[\\ & 820 + 410 = 1230 \\ & \backslash] \end{aligned}$$

which matches the total given. Also, check the relationship:

$$\begin{aligned} & \backslash[\\ & \text{Television} = 2 \times \text{DVD Player} \\ & \backslash] \end{aligned}$$

$$\begin{aligned} & \backslash[\\ & 820 = 2 \times 410 \\ & \backslash] \end{aligned}$$

which holds true. The solution is correct.

Practical Applications of This Problem

Understanding how to break down such problems is useful in various real-life scenarios:

- **Budget Planning:** Estimating costs when purchasing multiple items with known relationships.
- **Shopping Comparisons:** Comparing prices of items when discounts or bundle deals are involved.
- **Financial Analysis:** Allocating funds proportionally among different expenses.

This problem demonstrates a common algebraic approach to solving word problems involving proportional relationships and total sums.

Related Mathematical Concepts

To deepen your understanding, here are some related concepts that often appear in similar problems:

1. Proportional Relationships

Proportions describe how quantities relate to each other, often expressed as ratios. In this case, the TV's cost is twice that of the DVD player, which is a simple ratio:

$$\frac{\text{TV}}{\text{DVD Player}} = 2 : 1$$

2. Linear Equations

Most problems like this can be formulated as linear equations, which have the form $ax + b = c$. Solving these equations allows us to find unknown quantities quickly.

3. Word Problems and Algebra

Translating words into algebraic expressions is a vital skill in mathematics, enabling the solving of real-world problems systematically.

Additional Practice Problems

To strengthen your understanding, try solving similar problems:

- Problem 1:** A stereo system and a speaker cost a total of \$950. The stereo system costs three times as much as the speaker. Find the individual costs.
- Problem 2:** A laptop and a tablet together cost \$1500. The laptop costs \$300 more than the tablet. Find the cost of each device.
- Problem 3:** A bag of apples and a bag of oranges cost \$20 in total. If the apples cost twice as much as the oranges, find the cost of each.

These problems follow the same pattern—defining variables, setting up equations, and solving.

Summary

In summary, solving for the individual costs of a television and DVD player when their total cost and relationship are known involves:

- Assigning variables to unknowns.
- Writing an equation based on the given relationships.
- Solving the equation algebraically.
- Verifying the solution.

In our example, we found that the DVD player costs \$410, and the television costs \$820. This systematic approach can be applied to a wide range of similar problems involving proportional relationships and totals.

Conclusion

Understanding how to approach problems where one item's cost is a multiple of another and their combined total is known is a valuable skill in mathematics and everyday life. Whether budgeting for electronics, comparing prices, or analyzing financial data, the ability to set up and solve such equations is essential. Remember to always verify your solutions to confirm their accuracy, and practice with various scenarios to strengthen your problem-solving skills.

Frequently Asked Questions

What is the total cost of the television and DVD player?

The total cost is \$1230.

If the cost of the television is twice the cost of the DVD player, how can we represent their costs mathematically?

Let the cost of the DVD player be x , then the television costs $2x$.

How do you find the individual costs of the television and DVD player?

Set up the equation: $2x + x = 1230$; solve for x to find the DVD player's cost, then double it for the television.

What is the cost of the DVD player in this scenario?

The DVD player costs \$410.

What is the cost of the television in this scenario?

The television costs \$820.

How can you verify the correctness of the calculated costs?

Add the costs: \$820 (TV) + \$410 (DVD) = \$1230, which matches the total given.

If the total cost increased to \$1500, what would be the new cost of the television?

Set up the equation: $2x + x = 1500$; solve for x to find the DVD's new cost, then double it for the TV.

Can you express the costs of the television and DVD player as algebraic expressions?

Yes, the DVD costs x , and the television costs $2x$.

What assumptions are made in solving this problem?

The main assumptions are that the costs are in dollars, the television costs exactly twice as much as the DVD player, and there are no additional costs or discounts.

How can this problem be generalized for different total costs and price ratios?

Use algebra: if total cost is T and the ratio of television to DVD is r , then $\text{DVD} = T / (r + 1)$, and $\text{Television} = r \text{ DVD}$.

Additional Resources

In-Depth Analysis of the Cost Breakdown for a Television and DVD Player

When it comes to purchasing home entertainment systems, understanding the cost distribution between different components can be quite insightful. The scenario where a television and DVD player together cost a total of \$1,230, with the television being twice as expensive as the DVD player, offers a compelling case study in cost analysis, consumer decision-making, and product valuation. This detailed review delves into the various facets of this situation, exploring the mathematical reasoning, practical implications, and broader context surrounding such purchases.

Understanding the Basic Cost Relationship

Setting the Stage: The Total Cost

The total expenditure on a television and DVD player sums up to \$1,230. This figure sets the foundation for our analysis. To analyze how this total is composed, we need to define variables and mathematical relationships:

- Let x be the cost of the DVD player.
- Since the television costs twice as much as the DVD player, the cost of the television is $2x$.

Therefore, the total cost equation becomes:

$$\begin{aligned} & \text{Cost of TV} + \text{Cost of DVD Player} = 1230 \\ & 2x + x = 1230 \end{aligned}$$

Solving for x :

$$\begin{aligned} & 3x = 1230 \\ & x = \frac{1230}{3} = 410 \end{aligned}$$

Thus,

- Cost of DVD Player = \$410
- Cost of Television = $2 \times 410 = \$820$

This straightforward calculation provides a clear picture: the television is significantly pricier than the DVD player, reflecting typical market trends where larger screens and advanced features command higher prices.

Market Context and Price Justification

Consumer Electronics Pricing Dynamics

Understanding why a television might be twice as expensive as a DVD player involves examining market factors:

- **Size and Display Technology:** Larger screens and advanced display technologies (LED, OLED, 4K, HDR) dramatically increase cost.
- **Features and Smart Capabilities:** Modern TVs often include smart features, internet connectivity, voice control, and built-in apps, adding to the price.

- Brand and Build Quality: Premium brands and durable build materials contribute to higher costs.
- DVD Player Simplicity: Conversely, DVD players are generally straightforward devices with limited features, making them more affordable.

In this scenario, the cost differential aligns well with these market realities, where the television's larger size and advanced tech justify its higher price.

Deeper Mathematical Analysis and Variations

Alternative Cost Scenarios

While the primary calculation provides specific figures, it's valuable to consider how changes in assumptions could affect the costs:

- If the total cost increased or decreased: For example, if the total was \$1,400 or \$1,050, how would the individual costs change?
- If the ratio differed: Suppose the TV costs 1.5 times the DVD player instead of twice.

Let's examine each briefly.

Scenario 1: Total Cost is \$1,400

Using the same ratio:

$$\begin{aligned} \left[\begin{aligned} 2x + x &= 1,400 \\ 3x &= 1,400 \\ x &= \frac{1,400}{3} \approx 466.67 \end{aligned} \right] \end{aligned}$$

Therefore,

- DVD Player: $\approx \$467$
- Television: $\approx \$933$

Scenario 2: Total Cost is \$1,050

$$\begin{aligned} \left[\begin{aligned} 3x &= 1,050 \\ x &= 350 \end{aligned} \right] \end{aligned}$$

Then,

- DVD Player: \$350
- Television: \$700

Scenario 3: Ratio of 1.5 times

$$\begin{aligned} & \text{1.5x} + x = \text{Total Cost} \\ & 2.5x = \text{Total Cost} \\ & x = \frac{\text{Total Cost}}{2.5} \end{aligned}$$

For the original total (\$1,230):

$$x = \frac{1230}{2.5} = 492$$

- DVD Player: \$492
- Television: \$738

These variations demonstrate how the overall cost and ratio assumptions impact individual component pricing.

Practical Considerations in Purchasing

Budget Planning

Understanding the cost breakdown helps consumers plan budgets effectively:

- Prioritize features: Decide if investing more in a larger, smarter TV is worth the extra expense.
- Balance affordability and quality: Recognize that higher prices often correlate with better display quality, durability, and features.
- Consider future upgrades: A more expensive TV may last longer and provide a better viewing experience.

Value for Money

When evaluating whether the \$820 spent on the TV and \$410 on the DVD player are justified:

- Market comparison: Check current prices for similar models.
- Feature set: Ensure the TV offers desired specifications (resolution, size, smart features).
- Brand reputation: Consider trusted brands for reliability.
- Warranty and after-sales support: Higher-priced items often come with

improved support.

Broader Implications and Market Trends

Technology Evolution and Pricing

Over time, prices for electronics fluctuate due to:

- Technological advancements: Newer models may decrease in price as features become standard.
- Market competition: Increased competition drives prices down.
- Supply chain factors: Material costs and manufacturing efficiencies influence retail prices.

Impact of Consumer Preferences

Consumer preferences for larger screens, 4K resolution, and smart features have:

- Elevated the average price of modern TVs.
- Reduced the price difference between entry-level and premium models.
- Made the market more dynamic, with options at various price points.

Conclusion: Insights and Takeaways

This detailed exploration of a television and DVD player costing a total of \$1,230, with the TV being twice as expensive as the DVD player, offers several valuable insights:

- The basic algebraic approach clarifies the individual costs, revealing that the DVD player costs \$410, and the television costs \$820.
- Market factors justify the cost differential, emphasizing the importance of features, size, and technology.
- Variations in total cost or ratios demonstrate flexible purchasing strategies and how market trends influence pricing.
- Consumer decision-making benefits from understanding these cost relationships, enabling more informed choices.
- The electronics market continues to evolve, with prices reflecting technological progress and consumer demand.

In essence, this scenario underscores the importance of analytical thinking when evaluating electronic purchases, ensuring consumers can balance their budgets with their entertainment needs. Whether investing in a high-end smart TV or a basic DVD player, understanding the underlying cost structure enhances satisfaction and value for money.

A Television And Dvd Player Cost A Total Of 1230 The Cost Of The Television Is Two Times The Cost Of

A Television And Dvd Player Cost A Total Of 1230 The Cost Of The Television Is Two Times The Cost Of

Related Articles

- [A Domestic Insurer Issuing Variable Contracts Must Establish One Or MoreA. Liability AccountB. Annuity](#)
- [According To A Poll, 56% Of Voters Support Funding A New Community Center. A Surveyor Randomly Selects](#)
- [A Man Washes Clothes In A Stream Using A Detergent That Contains Phosphorus. What Type Of Pollution Is](#)

[Back to Home](#)