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Understanding the concepts of profit, loss, and their calculations is fundamental in commerce and business transactions. When Dhurba sells a book for Rs. 483 and incurs a loss of 8%, it becomes essential to determine the original cost price of the book. This not only helps in assessing the loss incurred but also aids in making informed decisions regarding pricing strategies in future sales. In this article, we will delve into the mathematical principles behind calculating the cost price when given the selling price and percentage loss, explore the step-by-step process, and discuss further implications related to profit and loss calculations.

Understanding Profit and Loss

What Is Profit?

Profit is the financial gain obtained when the selling price of an article exceeds its cost price. It is calculated as:

$$\text{Profit} = \text{Selling Price (SP)} - \text{Cost Price (CP)}$$

Profit Percentage is given by:

$$\text{Profit Percentage} = (\text{Profit} / \text{Cost Price}) \times 100$$

What Is Loss?

Loss occurs when the selling price of an article is less than its cost price. It is calculated as:

$$\text{Loss} = \text{Cost Price (CP)} - \text{Selling Price (SP)}$$

Loss Percentage is given by:

$$\text{Loss Percentage} = (\text{Loss} / \text{Cost Price}) \times 100$$

Significance of Percentage Loss

The percentage loss indicates how much percentage of the cost price has been lost during the sale. For example, an 8% loss means that Dhurba sold the book at a price 8% less than its original cost price.

Calculating the Cost Price from Selling Price and Loss Percentage

Given Data:

- Selling Price (SP) = Rs. 483
- Loss Percentage = 8%

The goal is to find the Cost Price (CP).

Step-by-Step Calculation:

1. Express the relationship between cost price and selling price considering loss:

Since there is an 8% loss,

$$\begin{aligned} & \text{SP} = (100\% - 8\%) \times \text{CP} = 92\% \times \text{CP} \end{aligned}$$

2. Convert the percentage to decimal form:

$$\begin{aligned} & 92\% = \frac{92}{100} = 0.92 \end{aligned}$$

3. Set up the equation:

$$\begin{aligned} & 483 = 0.92 \times \text{CP} \end{aligned}$$

4. Solve for CP:

$$\begin{aligned} & \text{CP} = \frac{483}{0.92} \end{aligned}$$

$$\begin{aligned} & \text{CP} = 525 \end{aligned}$$

Therefore, the original cost price of the book is Rs. 525.

Additional Insights and Applications

Understanding the Profit and Loss Percentages

Knowing the cost price allows us to determine the actual profit or loss in monetary terms:

- Loss in Rs.:

$$\begin{aligned} \backslash \\ \text{Loss} &= \text{CP} - \text{SP} = 525 - 483 = \text{Rs. } 42 \\ \backslash \end{aligned}$$

- Profit or Loss Percentage:

Since Dhurba experienced an 8% loss, this aligns with the calculated loss of Rs. 42.

Calculating Selling Price for Desired Profit or Loss

Suppose Dhurba wants to sell the book at a profit of 10%. How much should he sell it for?

- Calculate the new selling price:

$$\begin{aligned} \backslash \\ \text{SP} &= \text{CP} + (10\% \times \text{CP}) = 525 + (0.10 \times 525) = 525 + 52.50 = \text{Rs. } 577.50 \\ \backslash \end{aligned}$$

Similarly, if Dhurba wants to avoid any loss, the selling price should be at least Rs. 525.

Real-World Implications and Strategies

Pricing Strategies Based on Cost Price

Understanding the relationship between cost price and selling price helps sellers strategize their pricing to maximize profit or minimize loss. For example:

- Margin of Profit: Marking up the cost price by a certain percentage.
- Reducing Loss: Selling at a price that covers the cost price to avoid losses.
- Breakeven Point: The minimum price at which the seller neither profits nor loses.

Importance in Business

Accurate calculation of cost price and understanding profit/loss percentages are vital for:

- Setting competitive prices.
- Evaluating product profitability.
- Making informed decisions on discounts and offers.
- Planning inventory and sales strategies.

Summary of Key Points

- When a seller incurs a percentage loss, the selling price is less than the cost price by that percentage.

- The cost price can be calculated using the formula: $CP = \frac{SP}{(1 - \frac{\text{Loss \%}}{100})}$.
- In Dhurba's case, with a selling price of Rs. 483 and an 8% loss, the cost price is Rs. 525.
- The loss incurred is Rs. 42, which can be useful for assessing profitability.
- Adjusting selling prices based on desired profit or minimizing loss involves similar calculations.

Conclusion

Calculating the original cost price of an item based on its selling price and loss percentage is a fundamental skill in commerce. Dhurba's scenario exemplifies how understanding these calculations can inform better pricing decisions and financial planning. By grasping the mathematical relationships involved, businesses and individuals can ensure they make informed, strategic choices that align with their financial goals. Whether aiming for profit maximization or loss minimization, mastering these concepts is essential for effective financial management in any market environment.

Frequently Asked Questions

What is the cost price of the book if Dhurba sells it for Rs. 483 at an 8% loss?

The cost price of the book is Rs. 525.

How do you calculate the cost price when a book is sold at an 8% loss for Rs. 483?

Use the formula $\text{Cost Price} = \text{Selling Price} / (1 - \text{Loss Percentage})$. So, $\text{Cost Price} = 483 / (1 - 0.08) = 483 / 0.92 = \text{Rs. } 525$.

What is the significance of knowing the loss percentage in calculating the cost price?

The loss percentage helps determine how much less than the original cost the book was sold for, which is essential for calculating the original cost price.

If Dhurba wants to sell the book at a profit instead of a

loss, how would the selling price change?

The selling price would need to be higher than Rs. 525, the cost price, to ensure a profit rather than a loss.

Can the same method be used to find the cost price if the selling price and profit percentage are known?

Yes, if the profit percentage is known, the cost price can be calculated using the formula:
 $\text{Cost Price} = \text{Selling Price} / (1 + \text{Profit Percentage})$.

What is the formula to find the cost price when a loss percentage and selling price are given?

The formula is: $\text{Cost Price} = \text{Selling Price} / (1 - \text{Loss Percentage})$.

How does a loss percentage affect the selling price relative to the cost price?

A loss percentage indicates the selling price is less than the cost price by that percentage. For an 8% loss, the selling price is 92% of the cost price.

What are common mistakes to avoid when calculating cost price from selling price and loss percentage?

Common mistakes include confusing loss and profit formulas, using the wrong percentage (e.g., profit instead of loss), or miscalculating the denominator in the formula.

Why is understanding percentage loss important for pricing strategies?

Understanding percentage loss helps in setting appropriate selling prices to minimize losses and ensure profitability.

In what other scenarios can the formula for cost price calculation be applied?

It can be applied in retail, wholesale, manufacturing, and any situation where goods are sold at a loss or profit percentage is known.

Additional Resources

By Selling A Book For Rs. 483, Dhurba Makes A Loss Of 8%. What Is The Cost Price Of The Book? At What Price Should He Have Sold It To Avoid Loss?

In the world of retail and commerce, understanding the relationship between cost price, selling price, and profit or loss percentage is fundamental. For budding entrepreneurs, students, and seasoned traders alike, mastering these concepts can significantly influence decision-making and profitability. Recently, a scenario involving Dhurba's sale of a book has caught the attention of many: he sold a book for Rs. 483 and incurred an 8% loss. This situation prompts a crucial question—what was the original cost price of the book, and at what selling price would Dhurba have broken even? This article aims to dissect this problem meticulously, providing a comprehensive guide on calculating cost price from loss percentage, understanding profit-loss relationships, and applying these principles to real-world trading scenarios.

Understanding the Basics: Profit, Loss, Cost Price, and Selling Price

Before delving into the calculations, it's essential to clarify the key terms involved:

- Cost Price (CP): The original price at which Dhurba purchased or produced the book.
- Selling Price (SP): The price at which Dhurba sold the book, Rs. 483 in this case.
- Profit: The gain made when the selling price exceeds the cost price.
- Loss: The deficit incurred when the selling price is less than the cost price.
- Profit or Loss Percentage: The ratio of profit or loss to the cost price, expressed as a percentage.

The fundamental formula linking these quantities is:

$$\text{Profit or Loss Percentage} = (\text{Profit or Loss}) / \text{Cost Price} \times 100$$

When a loss occurs, the profit/loss value becomes negative, indicating a deduction from the cost price.

Given Data and Objective

Let's restate the problem with clarity:

- Selling Price (SP) = Rs. 483
- Loss Percentage = 8%

Objective:

1. Calculate the Cost Price (CP) of the book.
2. Determine the selling price at which Dhurba would neither profit nor incur a loss—i.e., the break-even point.

Step-by-Step Calculation of the Cost Price

To find the cost price based on the loss percentage and selling price, we need to understand the relationship between these variables.

1. Expressing Loss in Terms of Cost Price and Selling Price

Since Dhurba incurs an 8% loss, the relationship between the selling price and cost price can be expressed as:

$$\text{Selling Price} = \text{Cost Price} - \text{Loss}$$

Or, in percentage terms:

$$SP = CP \times (1 - \text{Loss Percentage} / 100)$$

Given that the loss percentage is 8%, the formula becomes:

$$SP = CP \times (1 - 8/100) = CP \times (92/100)$$

This means:

$$CP = SP \times (100/92)$$

2. Substituting the Known Values

Plug in the given selling price:

$$CP = 483 \times (100/92)$$

Calculating numerator and denominator:

$$- 100/92 \approx 1.0869565$$

Therefore:

$$CP \approx 483 \times 1.0869565 \approx \text{Rs. } 525.00$$

Result: The original cost price of the book was approximately Rs. 525.

3. Interpretation and Significance

This calculation indicates that Dhurba purchased or valued the book at Rs. 525, but selling

it for Rs. 483 resulted in an 8% loss. Recognizing this relationship is crucial for traders to set appropriate prices that ensure profitability or minimize losses.

At What Price Should Dhurba Sell To Break Even?

Understanding the break-even point—the selling price at which Dhurba neither profits nor loses—is vital for strategic pricing.

1. The Break-Even Selling Price

The break-even point occurs when:

Selling Price (SP) = Cost Price (CP)

From our earlier calculation, the cost price is Rs. 525. Therefore, to avoid loss, Dhurba should sell the book at Rs. 525.

2. Practical Implications

- Selling below Rs. 525 results in a loss.
- Selling at Rs. 525 ensures zero profit or loss.
- To generate profit, Dhurba needs to sell above Rs. 525.

3. Additional Considerations

In real-world scenarios, factors such as market demand, competitor pricing, and customer perception influence pricing decisions. Traders often set prices slightly above the break-even point to account for taxes, discounts, or other costs.

Additional Insights and Related Calculations

While the primary problem involves loss calculation, similar principles can be applied to profit scenarios.

1. Calculating Selling Price for a Desired Profit

Suppose Dhurba wants to sell the book at a 10% profit. Then:

$$SP = CP \times (1 + \text{Profit Percentage} / 100) = \text{Rs. } 525 \times (1 + 10/100) = \text{Rs. } 525 \times 1.10 = \text{Rs. } 577.50$$

2. Calculating Profit Percentage from Cost Price and Selling Price

If Dhurba sells at Rs. 600, then:

$$\text{Profit} = \text{Rs. } 600 - \text{Rs. } 525 = \text{Rs. } 75$$

$$\text{Profit Percentage} = (75 / 525) \times 100 \approx 14.29\%$$

This demonstrates how profit margins can be calculated once the sale and cost prices are known.

Real-World Applications and Importance of Accurate Pricing

Understanding how to compute cost price and appropriate selling prices is more than an academic exercise; it's a critical skill for retailers, publishers, and entrepreneurs. Accurate calculations:

- Help in setting competitive yet profitable prices.
- Aid in assessing the financial health of a business.
- Support decision-making regarding discounts, sales, and inventory management.

For instance, in book publishing and sale, miscalculating the cost price can lead to losses or missed opportunities for profit.

Conclusion

The scenario involving Dhurba's sale of a Rs. 483 book at an 8% loss offers valuable insights into the practical application of percentage-based calculations in commerce. It underscores the importance of understanding the relationships between selling price, cost price, and profit-loss percentages. Through systematic calculation, we deduced that the original cost price of the book was approximately Rs. 525. Moreover, to break even, Dhurba should sell the book at Rs. 525, and any amount above that secures a profit.

Mastering such fundamental concepts empowers traders and business owners to make informed pricing decisions, optimize profitability, and sustain their operations in competitive markets. As commerce continues to evolve with technology and market dynamics, these basic principles remain timeless tools for financial success.

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