

10) AN ARTICLE WAS SOLD FOR RS. 415 AT A LOSS OF 17%. WHAT WOULD HAVE BEEN THE SALE PRICE, HAD IT BEEN

10) AN ARTICLE WAS SOLD FOR RS. 415 AT A LOSS OF 17%. WHAT WOULD HAVE BEEN THE SALE PRICE, HAD IT BEEN

UNDERSTANDING THE CONCEPT OF PROFIT AND LOSS CALCULATIONS IS ESSENTIAL FOR ANYONE INVOLVED IN BUYING OR SELLING GOODS. IN THIS ARTICLE, WE ANALYZE A SPECIFIC PROBLEM: AN ARTICLE WAS SOLD FOR RS. 415 AT A LOSS OF 17%. OUR GOAL IS TO DETERMINE WHAT THE SALE PRICE WOULD HAVE BEEN IF THE ARTICLE HAD BEEN SOLD AT A DIFFERENT PROFIT OR LOSS PERCENTAGE. THIS PROBLEM INVOLVES FUNDAMENTAL PERCENTAGE CALCULATIONS, REVERSE CALCULATIONS FOR COST PRICE, AND APPLYING THESE CONCEPTS TO FIND ALTERNATIVE SALE PRICES UNDER DIFFERENT SCENARIOS.

WHETHER YOU'RE A STUDENT PREPARING FOR EXAMS, A RETAIL BUSINESS OWNER, OR SOMEONE INTERESTED IN MASTERING BASIC FINANCIAL MATHEMATICS, THIS COMPREHENSIVE GUIDE WILL EQUIP YOU WITH THE TECHNIQUES NEEDED TO SOLVE SUCH PROBLEMS EFFICIENTLY.

UNDERSTANDING THE BASIC CONCEPTS: COST PRICE, SELLING PRICE, PROFIT, AND LOSS

BEFORE DELVING INTO THE CALCULATIONS, IT'S VITAL TO UNDERSTAND THE CORE TERMS INVOLVED:

COST PRICE (CP)

- THE ORIGINAL PRICE AT WHICH AN ARTICLE IS BOUGHT OR PRODUCED.
- IT FORMS THE BASIS FOR CALCULATING PROFIT OR LOSS.

SELLING PRICE (SP)

- THE PRICE AT WHICH THE ARTICLE IS SOLD.
- IT CAN BE MORE THAN OR LESS THAN THE COST PRICE, LEADING TO PROFIT OR LOSS.

PROFIT AND LOSS

- PROFIT OCCURS WHEN $SP > CP$.
- LOSS OCCURS WHEN $SP < CP$.
- PROFIT OR LOSS PERCENTAGE IS CALCULATED RELATIVE TO CP.

FORMULAS:

- $Profit = SP - CP$
- $Loss = CP - SP$
- $Profit\ Percentage = (Profit / CP) \times 100$
- $Loss\ Percentage = (Loss / CP) \times 100$

STEP-BY-STEP SOLUTION TO THE ORIGINAL PROBLEM

GIVEN DATA

- SELLING PRICE (SP) = Rs. 415
- Loss = 17%

OUR GOAL: FIND THE ORIGINAL COST PRICE AND THEN DETERMINE THE HYPOTHETICAL SALE PRICE UNDER DIFFERENT PROFIT OR LOSS SCENARIOS.

CALCULATING THE COST PRICE

SINCE THE ARTICLE WAS SOLD AT A LOSS OF 17%, THE RELATIONSHIP BETWEEN SP AND CP IS:

$$[SP = (1 - \frac{\text{Loss \%}}{100}) \times CP]$$

REARRANGED TO FIND CP:

$$[CP = \frac{SP}{1 - \frac{\text{Loss \%}}{100}}]$$

SUBSTITUTING THE KNOWN VALUES:

$$[CP = \frac{415}{1 - 0.17} = \frac{415}{0.83}]$$

CALCULATING:

$$[CP \approx \text{Rs. } 500]$$

HENCE, THE ORIGINAL COST PRICE OF THE ARTICLE IS APPROXIMATELY Rs. 500.

VERIFICATION OF LOSS PERCENTAGE

- Loss = CP - SP = 500 - 415 = Rs. 85
- Loss PERCENTAGE = $(85 / 500) \times 100 = 17\%$

THE CALCULATION CONFIRMS OUR UNDERSTANDING.

CALCULATING THE HYPOTHETICAL SALE PRICE UNDER DIFFERENT CONDITIONS

ONCE THE COST PRICE IS KNOWN, WE CAN FIND ALTERNATE SELLING PRICES CORRESPONDING TO DIFFERENT PROFIT OR LOSS PERCENTAGES.

SCENARIO 1: SELLING AT A PROFIT OF 20%

- PROFIT PERCENTAGE = 20%
- SALE PRICE = CP + PROFIT

$$[SP = CP \times \left(1 + \frac{\text{Profit \%}}{100}\right)]$$

$$[SP = 500 \times (1 + 0.20) = 500 \times 1.20 = \text{Rs. } 600]$$

THEREFORE, IF THE ARTICLE HAD BEEN SOLD AT A 20% PROFIT, THE SALE PRICE WOULD BE RS. 600.

SCENARIO 2: SELLING AT A LOSS OF 10%

- LOSS PERCENTAGE = 10%

- SALE PRICE = CP - LOSS

$$[SP = CP \times \left(1 - \frac{\text{Loss \%}}{100}\right)]$$

$$[SP = 500 \times (1 - 0.10) = 500 \times 0.90 = \text{Rs. } 450]$$

THUS, A 10% LOSS WOULD LEAD TO A SALE PRICE OF RS. 450.

SCENARIO 3: SELLING AT A PROFIT OF 25%

- PROFIT PERCENTAGE = 25%

$$[SP = 500 \times (1 + 0.25) = \text{Rs. } 625]$$

SELLING AT A 25% PROFIT WOULD MEAN A SALE PRICE OF RS. 625.

SCENARIO 4: SELLING AT A LOSS OF 5%

- LOSS PERCENTAGE = 5%

$$[SP = 500 \times (1 - 0.05) = \text{Rs. } 475]$$

THE SALE PRICE AT A 5% LOSS WOULD BE RS. 475.

SUMMARY TABLE OF ALTERNATIVE SALE PRICES

SCENARIO	PROFIT / LOSS %	SALE PRICE (RS.)	EXPLANATION
ORIGINAL	LOSS 17%	Rs. 415	GIVEN IN PROBLEM
20% PROFIT	PROFIT 20%	Rs. 600	CALCULATED ABOVE
10% LOSS	LOSS 10%	Rs. 450	CALCULATED ABOVE
25% PROFIT	PROFIT 25%	Rs. 625	CALCULATED ABOVE
5% LOSS	LOSS 5%	Rs. 475	CALCULATED ABOVE

UNDERSTANDING THE REVERSE CALCULATION

THE KEY SKILL DEMONSTRATED HERE IS THE ABILITY TO REVERSE THE CALCULATION FROM A KNOWN SELLING PRICE AND PERCENTAGE LOSS OR PROFIT TO FIND THE COST PRICE, AND SUBSEQUENTLY, THE HYPOTHETICAL SALE PRICES FOR DIFFERENT PERCENTAGES.

GENERAL FORMULA FOR CALCULATING SALE PRICE FOR A GIVEN PROFIT OR LOSS PERCENTAGE:

$$[SP = CP \times \left(1 + \frac{\text{Profit \% or Loss \%}}{100} \right)]$$

- FOR PROFIT: ADD THE PERCENTAGE
- FOR LOSS: SUBTRACT THE PERCENTAGE

SIMILARLY, TO FIND THE ORIGINAL COST PRICE GIVEN A SALE PRICE AND LOSS PERCENTAGE:

$$[CP = \frac{SP}{1 - \frac{\text{Loss \%}}{100}}]$$

PRACTICAL APPLICATIONS OF THESE CALCULATIONS

UNDERSTANDING AND APPLYING THESE FORMULAS HAS SEVERAL PRACTICAL BENEFITS:

- BUSINESS PROFIT PLANNING: HELPS DETERMINE OPTIMAL SELLING PRICES TO ACHIEVE DESIRED PROFIT MARGINS.
- PRICING STRATEGIES: ASSISTS IN SETTING COMPETITIVE PRICES WHILE MAINTAINING PROFITABILITY.
- FINANCIAL ANALYSIS: ENABLES ANALYSIS OF PAST SALES TO UNDERSTAND PROFIT/LOSS MARGINS.
- EDUCATIONAL PURPOSES: FUNDAMENTAL FOR STUDENTS PREPARING FOR QUANTITATIVE APTITUDE EXAMS.

COMMON MISTAKES TO AVOID

WHILE SOLVING SUCH PROBLEMS, WATCH OUT FOR:

- INCORRECT CONVERSION OF PERCENTAGES: ALWAYS CONVERT PERCENTAGES TO DECIMALS ACCURATELY.
- MIXING UP PROFIT AND LOSS FORMULAS: REMEMBER PROFIT INVOLVES ADDITION, LOSS INVOLVES SUBTRACTION.
- FORGETTING TO VERIFY CALCULATIONS: DOUBLE-CHECK CALCULATIONS BY VERIFYING THE PROFIT OR LOSS PERCENTAGE.

CONCLUSION

IN SUMMARY, THE PROBLEM OF AN ARTICLE SOLD FOR RS. 415 AT A 17% LOSS ALLOWS US TO CALCULATE THE ORIGINAL COST PRICE AND EXPLORE ALTERNATIVE SALE PRICES UNDER DIFFERENT PROFIT AND LOSS SCENARIOS. BY MASTERING THESE BASIC PERCENTAGE CALCULATIONS, YOU CAN CONFIDENTLY ANALYZE VARIOUS SALES AND PRICING STRATEGIES, WHICH ARE ESSENTIAL SKILLS IN BOTH ACADEMIC AND REAL-WORLD FINANCIAL CONTEXTS. REMEMBER, THE KEY STEPS INVOLVE REVERSING PERCENTAGE CALCULATIONS TO FIND THE COST PRICE AND THEN APPLYING STRAIGHTFORWARD FORMULAS TO DETERMINE DIFFERENT SALE

PRICES.

MASTERING THESE TECHNIQUES WILL EMPOWER YOU TO HANDLE A WIDE RANGE OF PROFIT-LOSS RELATED PROBLEMS EFFICIENTLY AND ACCURATELY.

FREQUENTLY ASKED QUESTIONS

AN ARTICLE WAS SOLD FOR RS. 415 AT A LOSS OF 17%. WHAT WOULD HAVE BEEN ITS SELLING PRICE IF SOLD AT A PROFIT OF 17% INSTEAD?

THE COST PRICE (CP) = RS. 500. SELLING AT A 17% PROFIT WOULD YIELD A SELLING PRICE OF RS. 585.

IF AN ARTICLE SOLD FOR RS. 415 AT A 17% LOSS, WHAT WAS THE ORIGINAL COST PRICE?

THE ORIGINAL COST PRICE WAS RS. 500.

HOW DO YOU CALCULATE THE SELLING PRICE WHEN AN ARTICLE IS SOLD AT A CERTAIN LOSS PERCENTAGE?

$\text{SELLING PRICE} = \text{COST PRICE} \times (1 - \text{LOSS PERCENTAGE}/100).$

WHAT IS THE FORMULA TO FIND THE NEW SELLING PRICE IF THE PROFIT PERCENTAGE IS CHANGED, GIVEN THE ORIGINAL COST PRICE?

$\text{NEW SELLING PRICE} = \text{COST PRICE} \times (1 + \text{PROFIT PERCENTAGE}/100).$

GIVEN AN ARTICLE'S SELLING PRICE AT A LOSS, HOW CAN YOU DETERMINE ITS COST PRICE?

$\text{COST PRICE} = \text{SELLING PRICE} / (1 - \text{LOSS PERCENTAGE}/100).$

ADDITIONAL RESOURCES

UNDERSTANDING THE IMPACT OF LOSS PERCENTAGE ON SALE PRICE: A DETAILED ANALYSIS

WHEN IT COMES TO SELLING PRODUCTS—BE IT IN RETAIL, MANUFACTURING, OR PERSONAL TRANSACTIONS—UNDERSTANDING THE CONCEPTS OF COST PRICE, SELLING PRICE, PROFIT, AND LOSS IS FUNDAMENTAL. AMONG THESE, LOSS PERCENTAGE PLAYS A CRUCIAL ROLE IN DETERMINING HOW MUCH A SELLER INCURS WHEN SELLING A PRODUCT BELOW ITS COST PRICE. TODAY, WE DELVE INTO A PRACTICAL EXAMPLE: AN ARTICLE SOLD AT RS. 415 AT A LOSS OF 17%. WE WILL EXPLORE HOW TO CALCULATE THE ORIGINAL COST PRICE, THE POTENTIAL SALE PRICE IF THE LOSS WERE DIFFERENT, AND THE BROADER IMPLICATIONS OF THESE CALCULATIONS.

DECIPHERING THE BASIC CONCEPTS: COST PRICE, SELLING PRICE, AND LOSS

PERCENTAGE

BEFORE WE ANALYZE THE PROBLEM, IT'S ESSENTIAL TO UNDERSTAND THE CORE TERMS:

- COST PRICE (CP): THE ORIGINAL PRICE AT WHICH AN ITEM IS PURCHASED OR MANUFACTURED.
- SELLING PRICE (SP): THE PRICE AT WHICH THE ITEM IS SOLD TO THE CUSTOMER.
- LOSS: WHEN THE SELLING PRICE IS LESS THAN THE COST PRICE.
- LOSS PERCENTAGE: THE RATIO OF LOSS TO THE COST PRICE, EXPRESSED AS A PERCENTAGE.

MATHEMATICALLY, THE LOSS PERCENTAGE IS CALCULATED AS:

$$\text{Loss \%} = \left(\frac{\text{Loss}}{\text{Cost Price}} \right) \times 100$$

OR EQUIVALENTLY,

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

IN PERCENTAGE TERMS, WHEN AN ARTICLE IS SOLD AT A LOSS, THE RELATION BETWEEN THE SELLING PRICE AND THE COST PRICE IS:

$$\text{Selling Price} = \text{Cost Price} \times \left(1 - \frac{\text{Loss \%}}{100} \right)$$

ANALYZING THE GIVEN DATA: SELLING AT Rs. 415 WITH A 17% Loss

LET'S APPLY THIS FUNDAMENTAL KNOWLEDGE TO OUR PROBLEM:

> AN ARTICLE WAS SOLD FOR Rs. 415 AT A LOSS OF 17%. WHAT WAS THE ORIGINAL COST PRICE?

THIS QUESTION LEADS US TO REVERSE-ENGINEER THE COST PRICE BASED ON THE SELLING PRICE AND THE LOSS PERCENTAGE.

CALCULATING THE COST PRICE (CP)

GIVEN:

- SELLING PRICE (SP) = Rs. 415
- LOSS PERCENTAGE = 17%

THE RELATION:

$$SP = CP \times \left(1 - \frac{\text{Loss \%}}{100} \right)$$

SUBSTITUTING THE KNOWN VALUES:

$$415 = CP \times (1 - 0.17) = CP \times 0.83$$

\]

REARRANGED, THE FORMULA FOR THE COST PRICE BECOMES:

\[

$$CP = \frac{SP}{0.83}$$

\]

CALCULATING:

\[

$$CP = \frac{415}{0.83} \approx 500$$

\]

RESULT: THE ORIGINAL COST PRICE OF THE ARTICLE WAS APPROXIMATELY Rs. 500.

THIS CALCULATION REVEALS THAT THE SELLER BOUGHT OR PRODUCED THE ARTICLE AT Rs. 500 AND SOLD IT AT Rs. 415, INCURRING A 17% LOSS.

WHAT WOULD HAVE BEEN THE SALE PRICE AT A DIFFERENT LOSS OR PROFIT PERCENTAGE?

THE CORE OF THE INQUIRY EXTENDS BEYOND THE INITIAL SALE: WHAT WOULD HAVE BEEN THE SALE PRICE IF THE LOSS OR PROFIT PERCENTAGE HAD BEEN DIFFERENT? TO EXPLORE THIS, WE NEED TO UNDERSTAND THE RELATIONSHIP BETWEEN LOSS/PROFIT PERCENTAGES AND SALE PRICES.

SCENARIO 1: SELLING AT A DIFFERENT LOSS PERCENTAGE

SUPPOSE THE SELLER WANTED TO SELL THE ARTICLE AT A DIFFERENT LOSS PERCENTAGE—SAY 10% INSTEAD OF 17%. WHAT WOULD THE NEW SELLING PRICE BE?

USING THE FORMULA:

\[

$$SP = CP \times \left(1 - \frac{\text{Loss \%}}{100}\right)$$

\]

SUBSTITUTING CP = Rs. 500:

\[

$$SP = 500 \times (1 - 0.10) = 500 \times 0.90 = \text{Rs. } 450$$

\]

OBSERVATION: SELLING AT A 10% LOSS WOULD HAVE RESULTED IN A SALE PRICE OF Rs. 450.

SIMILARLY, IF THE LOSS PERCENTAGE WERE 5%, THE SALE PRICE WOULD BE:

\[

$$SP = 500 \times (1 - 0.05) = 500 \times 0.95 = \text{Rs. } 475$$

\]

IMPLICATION: AS THE LOSS PERCENTAGE DECREASES, THE SALE PRICE APPROACHES THE COST PRICE.

SCENARIO 2: SELLING AT A PROFIT PERCENTAGE

WHAT IF THE SELLER AIMED FOR A PROFIT INSTEAD? FOR EXAMPLE, A 10% PROFIT ON THE COST PRICE.

THE PROFIT PERCENTAGE CALCULATION:

$$SP = CP \times \left(1 + \frac{\text{Profit \%}}{100}\right)$$

APPLYING THE NUMBERS:

$$SP = 500 \times (1 + 0.10) = 500 \times 1.10 = \text{Rs. } 550$$

INSIGHT: TO MAKE A 10% PROFIT, THE ARTICLE SHOULD BE SOLD AT Rs. 550.

SIMILARLY, FOR A 20% PROFIT:

$$SP = 500 \times 1.20 = \text{Rs. } 600$$

BROADER IMPLICATIONS AND PRACTICAL APPLICATIONS

UNDERSTANDING THESE CALCULATIONS IS VITAL IN VARIOUS CONTEXTS:

1. PRICING STRATEGY OPTIMIZATION

KNOWING HOW LOSS AND PROFIT PERCENTAGES RELATE TO SALE PRICES ENABLES SELLERS TO STRATEGIZE PRICING TO MEET REVENUE GOALS. FOR INSTANCE, IF A SELLER WANTS TO MINIMIZE LOSS OR MAXIMIZE PROFIT, THIS MATHEMATICAL INSIGHT GUIDES SETTING APPROPRIATE SELLING PRICES.

2. BREAKEVEN ANALYSIS

CALCULATING THE MINIMUM SALE PRICE TO AVOID LOSS IS CRITICAL. IN OUR CASE, Rs. 500 IS THE BREAKEVEN POINT—SELLING BELOW THIS INCURS A LOSS, ABOVE YIELDS PROFIT.

3. COST MANAGEMENT

ACCURATE KNOWLEDGE OF COST PRICE ENSURES INFORMED DECISIONS ABOUT PRICING AND PROFIT MARGINS. IT ALSO HELPS IN NEGOTIATING SUPPLIER PRICES OR REDUCING MANUFACTURING COSTS.

4. RISK ASSESSMENT

QUANTIFYING POTENTIAL LOSSES AT DIFFERENT SALE PRICES HELPS IN ASSESSING FINANCIAL RISKS, ESPECIALLY IN COMPETITIVE MARKETS OR FLUCTUATING DEMAND SCENARIOS.

SUMMARY OF KEY CALCULATIONS

SCENARIO	LOSS/PROFIT PERCENTAGE	SALE PRICE (RS.)	EXPLANATION
ORIGINAL SALE	17% LOSS	RS. 415	DERIVED INITIAL COST PRICE RS. 500
DIFFERENT LOSS	10% LOSS	RS. 450	LESS LOSS, HIGHER SALE PRICE
SMALLER LOSS	5% LOSS	RS. 475	CLOSER TO COST PRICE
PROFIT SCENARIO	10% PROFIT	RS. 550	TO GAIN PROFIT, SELL AT RS. 550
HIGHER PROFIT	20% PROFIT	RS. 600	EVEN HIGHER SALE PRICE

CONCLUSION: MASTERING LOSS AND PROFIT CALCULATIONS FOR BETTER SALES DECISIONS

THE EXAMPLE OF AN ARTICLE SOLD AT RS. 415 AT A 17% LOSS OFFERS A CLEAR INSIGHT INTO THE FUNDAMENTAL PRINCIPLES OF COST-PRICE AND SALE-PRICE RELATIONSHIPS. BY UNDERSTANDING HOW LOSS AND PROFIT PERCENTAGES INFLUENCE THE SALE PRICE, SELLERS AND ENTREPRENEURS CAN MAKE INFORMED DECISIONS TO OPTIMIZE THEIR REVENUES AND MINIMIZE LOSSES.

WHETHER ADJUSTING PRICES TO MEET PROFIT GOALS OR SETTING MINIMUM ACCEPTABLE SALE PRICES TO PREVENT LOSSES, THESE CALCULATIONS SERVE AS ESSENTIAL TOOLS. AS WE SEE, A 17% LOSS ON A RS. 500 ARTICLE RESULTS IN A SELLING PRICE OF RS. 415, BUT THIS CAN BE MODIFIED BASED ON STRATEGIC AIMS—BE IT REDUCING LOSS, ACHIEVING PROFIT, OR MAINTAINING COMPETITIVE PRICING.

IN ESSENCE, MASTERING THESE FUNDAMENTAL CONCEPTS NOT ONLY ENHANCES FINANCIAL LITERACY BUT ALSO EMPOWERS BETTER BUSINESS PRACTICES, ENSURING SUSTAINABLE GROWTH AND PROFITABILITY IN ANY COMMERCIAL VENTURE.

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