



SNS COLLEGE OF TECHNOLOGY
(An Autonomous Institution)
COIMBATORE-35



DEPARTMENT OF AEROSPACE ENGINEERING

19GET275 – VQAR 1

UNIT -1 QUANTITATIVE ABILITY I

Profit and Loss

Terms related to Profit and Loss

We have come across the word profit and loss many times. Profit stands for gain, advantage or benefit whereas loss is the opposite of profit that involves expenditure as compared to gain.

Cost Price (CP): It is the amount at which a product is purchased. Sometimes it also includes overhead expenses, transportation cost, etc. For example, you bought a refrigerator at Rs 10,000 and spent Rs 2000 for transportation and Rs 500 for set up. So the total cost price is the sum of all the expenditure done, that is, Rs 12,500.

Selling Price (SP): It is the amount at which a product is sold. It may be more than, equal to or less than the cost price of the product. For example, if a shopkeeper bought a chair at Rs 500 and sold it at Rs 600, then the cost price of the chair is Rs 500 and the selling price of the chair is Rs 600.

Profit (P): If a product is sold at a price more than its cost price then the seller makes a profit. For example, a plot was purchased at Rs 50,000 and three years later it was sold at Rs 1,50,000 then there is a profit of 1 lakh.

Loss (L): If a product is sold at a price less than its cost price then the seller makes a loss.

For example, a phone is bought at Rs 20,000 and a year later it was sold for Rs 12,000 then the seller made a loss of Rs 8000.

Profit Percent (P%): It is the percentage of profit on the cost price.

Loss Percent (L%): It is the percentage of loss on the cost price.

- Profit = Selling Price – Cost Price
- Loss = Cost Price – Selling Price
- Profit % = (Profit / Cost Price) × 100%
- Loss% = (Loss / Cost Price) × 100%
- Selling Price = [(100 + Profit%)/100] × Cost Price
- Cost Price = [100/(100 + Profit%)] × Selling Price
- Selling Price = [(100 – Loss%)/100] × Cost Price
- Cost Price = [100/(100 – Loss%)] × Selling Price
- Discount = Marked Price – Selling Price



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Solved Examples:

Given below are the profit and loss examples found in real life:

1. Find the Selling price of a bicycle of Rs 700 if
 - a. Loss is Rs 50
 - b. If Profit percentage is 50%

Solution:

- a. CP = Rs 700

Loss = Rs 50

Let SP be x.

We know in case of loss, the cost price is more than the selling price.

By using the formula of CP and SP.

Loss = CP - SP

Rs 50 = Rs 700 - x

x = Rs 700 - Rs 50

x = Rs 650

Thus, the selling price is Rs 650.

- b. CP = Rs 700
Profit % = 50
Let the profit be x.

Profit % =

$$\frac{\text{profit}}{\text{Cost price}} \times 100$$

×x

100

50 =

$$\frac{x}{700} \times 100 = \frac{50}{700} \times 100$$

$$50 = \frac{x}{750} \times 100$$

x = 7

×x

50



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$x = \text{Rs } 350$

Profit = Rs 350.

From the profit and loss Mathematics formula,

Profit = SP - CP

$\text{Rs } 350 = \text{SP} - \text{Rs } 700$

$\text{SP} = \text{Rs } 700 + \text{Rs } 350$

$= \text{Rs } 1050$

Thus, the selling price is Rs 1050 if the profit is 50% of the cost price.

2) A shopkeeper bought two TV sets at Rs 10,000 each such that he can sell one at a profit of 10% and the other at a loss of 10%. Find his overall profit or loss.

Solution:

The shopkeeper bought two TV sets. He made a profit by selling one and a loss by selling another. So let us divide the solution into two parts:

<p>The cost price of TV = Rs 10,000 Profit % = 10 % of cost price According to the formula, Profit % = $\frac{\text{profit}}{\text{Cost price}} \times 100 = \frac{\text{Profit}}{10,000} \times 100$ $10 = \frac{\text{profit}}{10,000} \times 100$ $10 = \frac{\text{profit}}{100} \times 100$ <p>Therefore, Profit = Rs 1000 If CP = Rs 10,000 and Profit = Rs 1000 Then, SP = 10,000+1000 = Rs 11000</p> </p>	<p>The cost price of TV = Rs 10,000 Loss % = 10 % of cost price According to the formula, Loss % = $\frac{\text{Loss}}{\text{Cost price}} \times 100 = \frac{\text{Loss}}{10,000} \times 100$ $10 = \frac{\text{Loss}}{10,000} \times 100$ $10 = \frac{\text{Loss}}{100} \times 100$ <p>Therefore, Loss = Rs 1000 If CP = Rs 10,000 and Loss = Rs 1000 Then, SP = 10,000-1000 = Rs 9000</p> </p>
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Total Cost price = Rs 10,000 + Rs 10,000
 $= \text{Rs } 20,000$

Total Selling price = Rs 11,000 + Rs 9000
 $= \text{Rs } 20,000$

As the cost price is equal to the loss price, there is neither a profit nor a loss.



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3) A shopkeeper bought 200 bulbs for Rs 10 each. Out of those, 5 bulbs were fused so he sold the remaining at Rs 12 each. Find the percentage of gain or loss.

Solution:

No of bulbs shopkeeper bought = 200

Cost of 1 bulb = Rs 10

Cost of 200 bulbs = Rs 10 x 200 = Rs 2000.

Therefore, the total cost price of 200 bulbs is Rs 2000

If 5 bulbs are thrown away then the number of bulbs left = 200 - 5 = 195.

Selling price of one bulb = Rs 12

Selling price of 195 bulbs = Rs 195 x 12 = Rs 2340

Therefore, the total selling price of 200 bulbs is Rs 2340

Selling price is more than the cost price, this means that the shopkeeper made a profit.

$$\begin{aligned} \text{Profit} &= \text{SP} - \text{CP} \\ &= \text{Rs } 340 \end{aligned}$$

Profit % =

$$\frac{\text{profit}}{\text{Cost price}} \times 100 = \frac{340}{2000} \times 100$$

=

$$17\%$$

= 17%

Thus, the shopkeeper made a profit of 17% on selling 195 bulbs at Rs 12.

4) Ankit bought a plot at Rs 2,25,000. He wanted an overall profit of 12% but he sold one-third of the plot at a loss of 8% so at what price should he sell the remaining plot of land?

Solution:

The cost price of the entire plot = Rs 2,25,000.

Cost price of 1/3rd of the plot = $\frac{1}{3}$

xx

$$2,25,000 = 75000$$

Loss % =



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Loss Cost price $\frac{C - S}{C} \times 100$

××

100

$$8\% = \frac{\text{loss}}{75000} \times 100$$

××

100

loss =

$$8 \times 75000 \div 100 = 6000$$

= 6000.

Sumit suffered a loss of Rs 6000 on selling 1/3rd of the land

SP for 1/3rd of the land = 75000 - 6000 = 69,000.

To make a profit of 12% of 2,25,000, is

P% =

$$\frac{P}{C} \times 100$$

$$12 \times \frac{P}{225000} \times 100$$

$$12 \times 225000 \div 100 = 27000$$

=P

Profit = Rs 27,000

Thus, to get a profit of Rs 27,000

SP = 2,25,000 + 27,000 = Rs 2,52,000

Sumit has already sold 1/3rd of the land at Rs 69,000 thus he needs to sell the remaining land at Rs (2,52,000 - 69,000) i.e, Rs 1,83,000.

Therefore, Sumit needs to sell the remaining plot at Rs 1,83,000.



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‘Percentage’ Vs ‘Profit and Loss’

Percentage, increase and decrease is closely related to profit, loss and their percentage in the profit and loss chapter. A percentage is a ratio that represents nothing but a fraction of 100. We use percentage for standardizing different quantities as the denominator is always 100. We not only represent data in percentage but also indicate the increase and decrease of value in percentage. The profit and loss concepts of increase percent relates to profit percent whereas decrease percent relates to loss percent. The only difference in profit and loss problems and percentage is that profit and loss percent deal with only money and play a great role in the financial calculation in all the businesses whereas increase and decrease percent can be used for anything.

Increase Percent

Suppose, the population of a village is 30,000. If the percentage of the population in the next two years is 50% of the actual population then what is the current population of the village?

We know that the actual or initial population of the village is 30,000. If 50% of the population is increased then that means 50% of 30,000 is increased.

50% of 30,000 =

$$5010050100$$

of 30,000

=

$$50100 \times 30,000$$

$$= 15,000$$

This means, in two years 15,000 people increased. So the current number of people is 30,000 + 15,000 which equals 45,000. Thus, the current population of the village is 45,000.

The relation between Increase Percent and Profit Percent.

Profit percent is the increased value of the cost price of the product. Suppose the initial value (Cost price) of a house was 6 lakhs after a few years the value of the house increased 50% of the initial value.

Increased value = Increase % =



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$$\text{increase} \frac{\text{Original Value} \times 100}{\text{Original Value}} \times 100$$

$$= 50\% \text{ of } 6\text{lakhs}$$

$$= \frac{50}{100} \times 600000$$

of 6,00,000

$$= 3 \text{ lakhs}$$

Current Value = 6 lakhs + 3 lakhs = 9 lakhs

If the house is sold at the current value then the selling price will be 9 lakhs.

According to profit and loss basics,

Profit = Selling Price - Cost Price

$$= 9 \text{ lakhs} - 6 \text{ lakhs}$$

$$= 3 \text{ lakhs}$$

Note:

Increase % =

$$\text{increase} \frac{\text{Original Value} \times 100}{\text{Original Value}} \times 100$$

whereas Profit % =

$$\frac{\text{profit}}{\text{Cost price}} \times 100$$

Therefore, profit is equal to the increase in the value and profit percentage is equal to the increased percentage.

The Difference between Increase Percent and Profit Percent.

Increase Percent	Profit Percent
It is calculated on the basis of the initial value	It is calculated on the basis of cost price



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It is used to calculate the increase in the number of things, population, etc.	It is used to calculate the increase in the value of the commodity or product.
It may and may not deal with money.	It deals with money.

Learn about Profit and Loss with Vedantu

Mathematics is an art and it is the science and study of quality, structure, space, and change of any object. Mathematicians seek out patterns, formulate new conjectures, and establish the truth by rigorous deduction from appropriately chosen axioms and definitions.

It is the science of numbers, quantities, and shapes, how it is measured, and the relations between them. With knowledge of Mathematics, you can actually study the science that revolves around numbers, shapes, and patterns, how things can be counted, how particular things are organized. This subfield of Mathematics with alphabets is usually called algebra and there are lots more in Math.

Definition and Formula

Finding the amount of profit or loss is explained in detail in this chapter. If you subtract the smaller value from the greater value accordingly you can calculate the profit or loss percentage within minutes. In the case of profit, the selling price will always be more than the actual cost price. Profit = Selling Price - Cost Price. Similarly, in the case of loss, the cost price is more than the planned selling price.

The formula to calculate the profit percentage is
Profit % = Profit/Cost Price × 100.

The formula to calculate the loss percentage is
Loss % = Loss/Cost Price × 100.



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Calculation

To effectively calculate and produce a profit and loss statement at the end of a financial year, the total of a business's revenue sources is added and that of the business's total expenses that are connected to gaining revenue will be subtracted from the profit. The profit and loss statement, also called an income statement of any business, will provide details of a company's financial performance for any specific period of time. We would like to know the financial condition.