

Percentage

Today we will be covering a very important topic from the quantitative aptitude section that is **-Percentage**. These formulas and shortcuts will be helpful for your upcoming teaching exams.

Percentage

- The percentage is per-cent which means parts per hundred.

Percent sign

- **The percent sign is the symbol:** %
- It is written to the right side of the number: 50%

Percentage Definition

- The percentage is a value that represents the proportion of one number to another number.

- **1 percent** represents **1/100** fraction.

If we have to convert the percentage into a fraction than it is divided by 100.

Example 1:- if we write **45%** then it's equal to **45/100** or in fraction **9/20** or in decimal **0.45**

If we have to convert the fraction into percentage we have to multiply with 100.

Example 2:- if we write **3/5** in fraction it is equal to **60% = 3/5 x 100 = 60**.

Convert Percentage into Decimal:

- **20%** = $20/100 = 0.5$

Convert Decimal Into Percentage:

- **0.25** = $(0.25 \times 100) \% = 25\%$
- **1.50** = $(1.50 \times 100) \% = 150\%$

Types of Formulas and Short Tricks

Type 1: Percentage Increase/Decrease:

- **If the price of a commodity increases by R%, then the reduction in consumption so as not to increase the expenditure is:** $[R / (100 + R)] \times 100\%$
- **If the price of a commodity decreases by R%, then the increase in consumption so as not to decrease the expenditure is:** $[R / (100 - R)] \times 100\%$

Type 2: Results on Population:

Let the population of a town be P now and suppose it increases at the rate of R% per annum, then:

- Population after n years = $P(1 + R/100)^n$
- Population n years ago = $P/(1 + R/100)^n$

Type 3: Results on Depreciation:

Let the present value of a machine be P. Suppose it depreciates at the rate of R% per annum. Then:

- Value of the machine after n years = $P(1 - R/100)^n$
- Value of the machine n years ago = $P/[(1 - R/100)^n]$
- If A is R% more than B, then B is less than A by = $[R / (100 + R)] \times 100\%$
- If A is R% less than B, then B is more than A by = $[R / (100 - R)] \times 100\%$

Note: For two successive changes of x% and y%, net change = $\{x + y + xy/100\}\%$

Some solved questions are mentioned below:-

Question 1:- What is the quantity whose 9% is 18.

Solution:- Let 9% of x = 18

$$x \times \frac{9}{100} = 18$$
$$\text{or, } x = \frac{18 \times 100}{9} = 200$$

Question 2:- In a school 74 % of the students are boys. If the number of girls is 1235, then find the total number of students in a college?

Solution:- Percentage of girls

$$= 100\% - 74\%$$

$$= 26\%$$

Let total number of students be x

According to question,

$$26\% \text{ of } x = 1236$$

$$x = \frac{1235}{26} \times 100$$
$$x = 4750$$

Question 3:- Mohan spends 68% of his income and also able to save Rs 1,500 per month. Find his monthly expenses?

Solution:- Savings = 100% - 68% = 32%

$$32\% = 1500$$

$$100\% = \frac{1500}{32} \times 100$$

$$= \text{Rs } 4687.5$$

$$\text{Expenses} = 4687.5 - 1500$$

$$= \text{Rs } 3187.5$$

Question 4:- If 75 is added into 75% of a number, gets that number, then that number will be

Solution:- Let the number be x

According to the question

$$75 + 75\%x = x$$

$$\Rightarrow x - \frac{75x}{100} = 75$$

$$\Rightarrow 25x = 7500$$

$$\Rightarrow x = 300$$

Q 5. Find the average percent increase of students per year if, the student of a hostel increased from 1,75,000 to 2,62,500 in a decade.

A 5. Increase in 10 years = (262500 - 175000) = 87500

$$\text{Increase\%} = \frac{87500}{175000} \times 100 = 50\%$$

$$\text{Required average} = \frac{50}{10} = 5\%$$