Chapter 5

Percentage

Many a times we heard about percentage. Like, Reena got 85 per cent marks, petrol-diesel rates are increasing by 2 per cent etc.

Children ! do you know what is percentage ?

The word per cent is an abbreviation of the Latin phrase ' percentum' which means per hundred or hundredths. Thus, the term per cent means per hundred or for every hundred or out of 1 hundred. In the above lines we say that Reena got 85 per cent marks. It means that she obtained 85 marks out of every 100 marks. The symbol '%' is used for per cent. Thus, 85 per cent will be written as 85%. The symbol '%' stand for $\dfrac{1}{100}$.

PER CENT AS A FRACTION

We know that per cent means per hundred or hundredths.

Now, $\dfrac{45}{100} = 45 \times \dfrac{1}{100} = 45$ hundredths = 45 per hundred = 45%

and $\dfrac{16}{100} = 16 \times \dfrac{1}{100} = 16$ hundredths = 16 per hundred = 16% and so on.

From the above discussion, it is clear that:

A fraction with denominator 100 is equal to that per cent, as the numerator.

Thus, $\dfrac{25}{100} = 25\%$, $\dfrac{57}{100} = 57\%$ and so on.

TO CONVERT A FRACTION INTO A PER CENT

To convert a given fraction into an equivalent per cent, we multiply it by 100 and write % sign.

Example 1: Express each of the following fractions as a per cent:

(a) $\dfrac{1}{4}$ 　　　　　(b) $\dfrac{2}{5}$

Solution :   (a) $\dfrac{1}{4} = \left[\dfrac{1}{4} \times 100\right]\%$

$= \dfrac{100}{4}\% = 25\%$

(b) $\dfrac{2}{5} = \left[\dfrac{2}{5} \times 100\right]\%$

$= \dfrac{200}{5}\% = 40\%.$

HOW TO CONVERT A DECIMAL INTO A PER CENT ?

To convert a given decimal into an equivalent per cent, we multiply it by 100 and write % sign.

Example 2 :   Express each of the following decimals as a per cent:

(a) 3.2   (b) 6.74   (c) 0.589

Solution :   (a) 3.2 $= (3.2 \times 100)\%$

$= 320\%$

(b) 6.74 $= (6.74 \times 100)\%$

$= 674\%$

(c) 0.589 $= (0.589 \times 100)\%$

$= 58.9\%.$

HOW TO CONVERT A PER CENT INTO A FRACTION ?

To convert a certain per cent into an equivalent fraction, we divide per cent numeral by 100 and drop the per cent sign.

Example 3 :   Express each of the following as a fraction in the simplest form:

(a) 65%

(b) $47\dfrac{1}{2}\%$

Solution :   (a) 65% $= 65 \times \dfrac{1}{100}$

$= \dfrac{65}{100} = \dfrac{13}{20}$

(b) $47\frac{1}{2}\% = 47\frac{1}{2} \times \frac{1}{100}$

$\quad = \frac{95}{2} \times \frac{1}{100}$

$\quad = \frac{19}{2} \times \frac{1}{20} = \frac{19}{40}.$

HOW TO CONVERT OF A PER CENT INTO A DECIMAL?

To convert a certain per cent into an equivalent decimal, we divide the percentage numeral by 100 and drop the per cent sign.

Example 4 : Express each of the following per cent as a decimal:

(a) 38%   (b) 12.8%

Solution : (a) $38\% = \frac{38}{100} = 0.38.$ (b) $12.8\% = \frac{12.8}{100} = 0.128.$

DAY-TO-DAY LIFE PROBLEMS

Let us study the following examples:

Example 5 : What will be 15% of Rs 300.

Solution : $\because \quad 15\% = \frac{15}{100}$

We have to find 15%, i.e., $\frac{15}{100}$ of 300.

Now, to find $\frac{15}{100}$ of 300, first we divide 300 by 100.

$300 \div 100 = 3$

and then multiply 3 by 15

$\quad\quad 3 \times 15 = 45$

Hence, 15% of ₹ 300 $= ₹ 45.$

Example 6 : In an exam, Mayank got 70% marks. If total marks in the exam were 500 then find the total marks obtained by him.

Solution : $\because \quad 70\% = \frac{70}{100}$

So, we have to find $\dfrac{70}{100}$ of 500.

$\because$ $500 \div 100 = 5$

and $5 \times 70 = 350$

Hence, the total marks obtained by Mayank is 350.

Testing Time 5.1

1. **Convert the following decimals to per cent :**

   (a) 0.54 (b) 0.6 (c) 3.02

   (d) 9.73 (e) 0.823 (f) 0.037

   (g) 0.206 (h) 0.0085

2. **Convert the following per cents to decimals :**

   (a) 24% (b) 63.8% (c) 173%

   (d) 70.4% (e) 9.23% (f) 0.17%

   (g) 8.05% (h) 0.0085%

3. **Convert the following fractions to per cent :**

   (a) $\dfrac{3}{5}$ (b) $\dfrac{7}{10}$ (c) $\dfrac{11}{25}$ (d) $\dfrac{23}{40}$

   (e) $2\dfrac{3}{4}$ (f) $6\dfrac{9}{10}$ (g) $37\dfrac{1}{2}$ (h) $18\dfrac{9}{25}$

4. Find the value of 24% of ₹ 400.

5. A man earns ₹ 6300 per month. He saves 35% of his earning. How much amount does he save per month?

6. A rope is 70 m long. Find the 40% of its length.