19 Percentage

After studying this chapter you will be able to understand,

- the concept of percentage.
- how to convert fractions into percentage.
- how to convert decimals into percentage.

Annual interest of 19.5% for 5 year fixed deposits.

Gold Capital Company

Annual profit 66%

15% of school children are malnutritioned.

The salaries of govenment servants will be raised by 20% by the budget this time.

A perch for Rs. 14 000... first pay 30% of the value and the balance in instalments of Rs. 2 500 per month.

Huge book exhibition and fair with discounts upto 75% till 31st of March.

19.1 Introduction to percentages

Given above are paper advertisements and a few news items. You can see a number with the sign % in each one of them. It is a percentage.

% → Idea of this → out of hundred

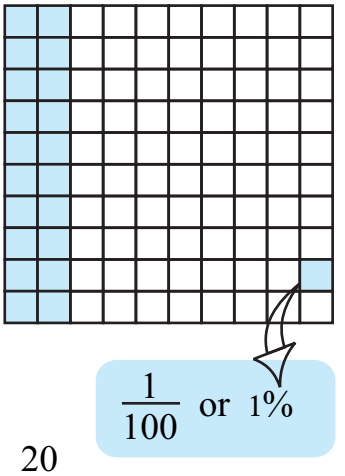
30 % → Idea of this → Thirty out of hundred

★ There are 100 squares in the figure .

★ A small square is $\frac{1}{100}$ of the whole.

★ It is also written as 1 %.

★ The shaded part of the figure as a percentage is $\boxed{20\%}$.



★ This is read as twenty percent.

★ It can also be considered as $\frac{20}{100}$.

★ 20% can be explained as $\frac{1}{100} \times 20$.

★ Similarly 20% is 20 of $\frac{1}{100}$ ths.

★ 50% is → $\frac{1}{100} \times 50$ and it can be considered as $\frac{50}{100}$.

★ 100% → $\frac{1}{100} \times 100$ It can be considered as $\frac{100}{100}$.

A fraction with a denominator of 100 is called a percentage. → A percentage is a fraction with a denominator of 100.

Accordingly $\boxed{\%}$ indicates $\boxed{\frac{1}{100}}$

Hence 28 % → $28 \times \frac{1}{100}$ → $\frac{28}{100}$

Exercise 19.1

Copy the following in your exercise book and fill in the blanks.

(1) (i) $\frac{12}{100}$ → Twelve percent → 12 %

(ii) ..... → ..... → 19 %

(iii) ..... → Thirty five percent → .....

(iv) $\frac{\square}{100}$ = 15 % (v) $\frac{48}{100}$ = $\square$ %

(vi) $\frac{\square}{\square}$ = 36 % (vii) $\frac{125}{100}$ = $\square$ %

(viii) $\frac{7\frac{1}{2}}{100}$ = $\square$ % (ix) $\frac{\square}{100}$ = 0.75 %

(x) $\frac{\square}{100}$ = 8.25 %

(2) Write the number suitable for $\square$ in this equality: $\frac{7}{25} = \frac{\square}{100}$

Accordingly, write it as a percentage.

(3) What is the fraction with denominator 100 equivalent to $\frac{7}{10}$? Write it as a percentage.

(4) Write the fraction with denominator 100 which is equivalent to $\frac{45}{500}$. Write this fraction as a percentage.

19.2 Let us convert a fraction into a percentage

You have learned how to indicate fractions with denominator 100 as percentage.

How can fractions with denominators other than 100 be converted to percentages?

Let us make the denominator 100. For this we can use the knowledge of equivalent fractions we have learned before.

Example 1

Write $\frac{3}{5}$ as a percentage.

When the fraction with denominator 100 equivalent to the above fraction is obtained,

it is $= \frac{3 \times 20}{5 \times 20} = \frac{60}{100} = 60\ \%$

Example 2

Converting a mixed number to a percentage.

Let us consider $1\frac{3}{4}$. Let us first convert it to an improper fraction.

After that we will apply the former method.

$\frac{7}{4} \times 100\ \% \longrightarrow 175\ \%$

To convert a fraction into a percentage we multiply it by 100%.

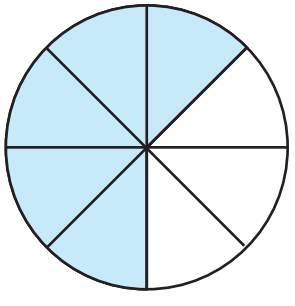
Exercise 19.2

(1) Convert each of the following fractions to percentages.

(i) $\frac{1}{2}$ (ii) $\frac{1}{4}$ (iii) $1\frac{2}{5}$ (iv) $\frac{9}{25}$ (v) $\frac{3}{4}$

(vi) $\frac{31}{50}$ (vii) $\frac{5}{8}$ (viii) $\frac{40}{200}$ (ix) $\frac{70}{1000}$ (x) $2\frac{1}{5}$

(2) Malitha obtained 15 marks out of 20 for an evaluation. Find the percentage of the mark he got.

(3) 

Indicate the shaded part of this figure,

(i) as a fraction

(ii) as a percentage

(4) There are 35 students in a class. On a certain day the number of absentees was 7.

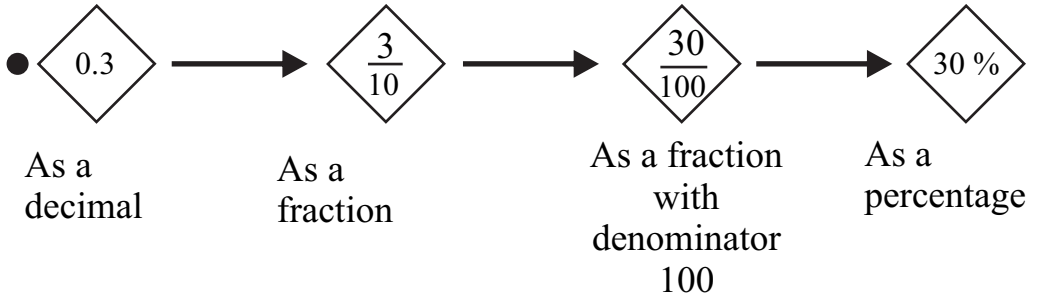
(i) Write the number of absentees as a fraction of the total number of students.

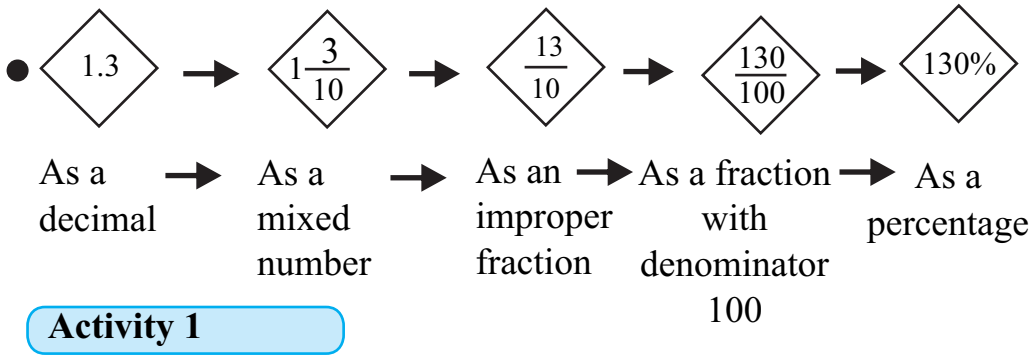
(ii) What is the percentage of absentees on that day?

(5) For a Mathematics question paper Dileepa got 31 marks out of 50 marks and 48 marks for a science question paper out of 75 marks. Find the subject for which he got a higher percentage of marks.

(6) By using the knowledge of percentages find the greater fraction out of $\frac{3}{4}$ and $\frac{4}{5}$.

19.3 Converting a decimal number into a percentage

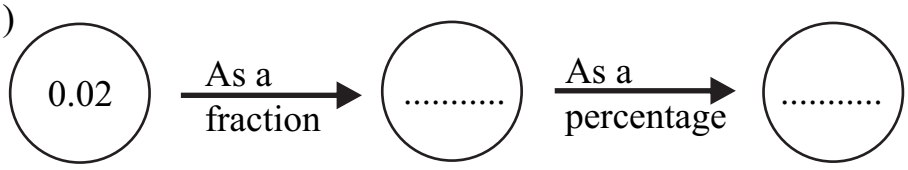




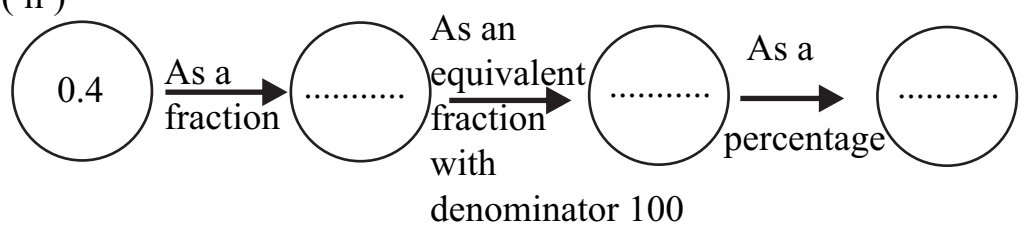
Activity 1

Copy the following and fill in the blanks.

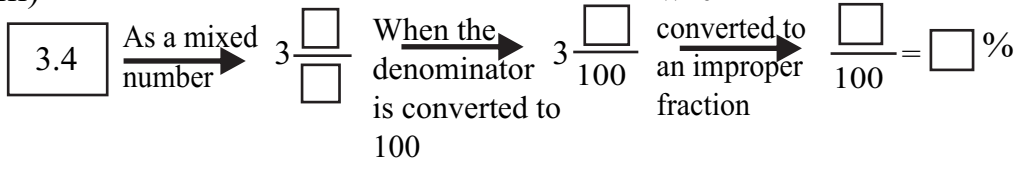
(i)



(ii)



(iii)



Two methods of converting a decimal number to a percentage are given below.

Example 3

Express 0.7 as a percentage

Method 1

$$0.7 \longrightarrow \frac{7}{10} \times \frac{10}{10} \longrightarrow \frac{70}{100} \longrightarrow 70\ \%$$

Method 2

$$0.7 \longrightarrow 0.7 \times 100\ \% \longrightarrow 70\ \%$$

Example 4

Express 0.075 as a percentage

Method 1

$$0.075 \longrightarrow \frac{75 \div 10}{1000 \div 10} \longrightarrow \frac{7.5}{100} \longrightarrow 7.5\ \%$$

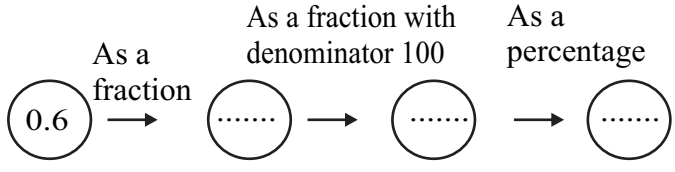
Method 2

$$0.075 \longrightarrow 0.075 \times 100\% \longrightarrow 7.5\ \%$$

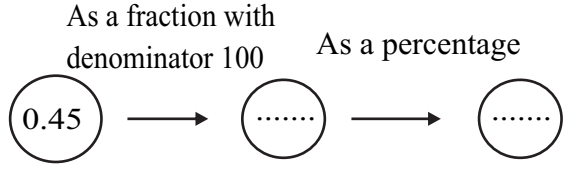
Excercise 19.3

(1) Copy each of the following and fill in the blanks.

(i)



(ii)



(iii) $2.5 \rightarrow 2\frac{\square}{10} \rightarrow 2\frac{\square}{100} \rightarrow \frac{\square}{100} \rightarrow \square\ \%$

(iv) $5.25 \rightarrow 5\frac{\square}{100} \rightarrow \frac{\square}{100} \rightarrow \square\ \%$

(v) $0.05 \rightarrow \frac{\square}{100} \rightarrow \square\ \%$

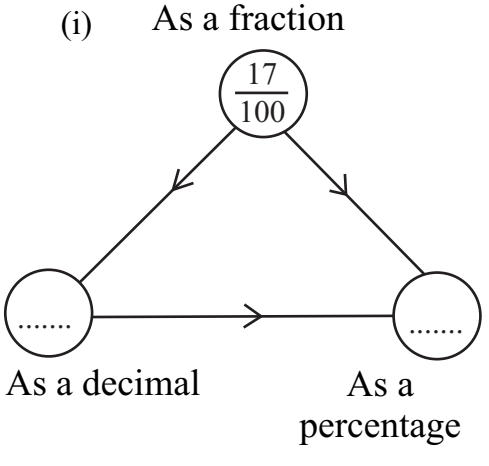
(vi) $\square \leftarrow 7\frac{\square}{10} \leftarrow \frac{\square}{10} \leftarrow \frac{\square}{100} \leftarrow 750\ \%$

(vii) $\square \leftarrow 1\frac{\square}{\square} \leftarrow \frac{14}{10} \leftarrow \frac{140}{100} \leftarrow 140\ \%$

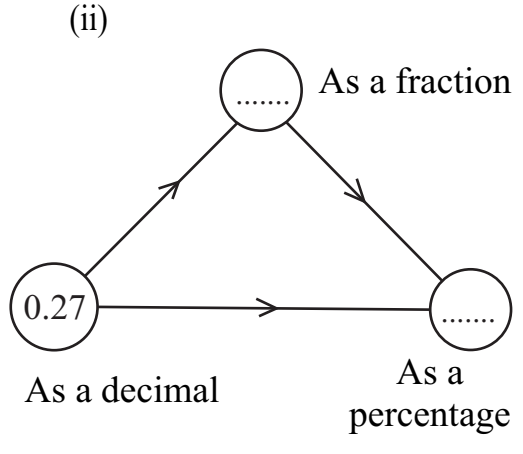
(viii) $5.275 \rightarrow 5\frac{\square}{1000} \rightarrow 5\frac{\square}{100} \rightarrow \frac{\square}{100} = \square\ \%$

(2) Fill in the blanks.

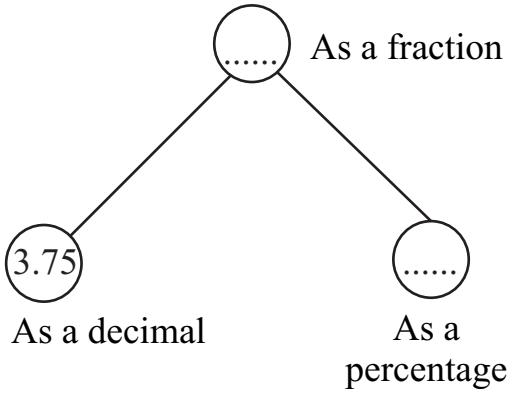
(i)



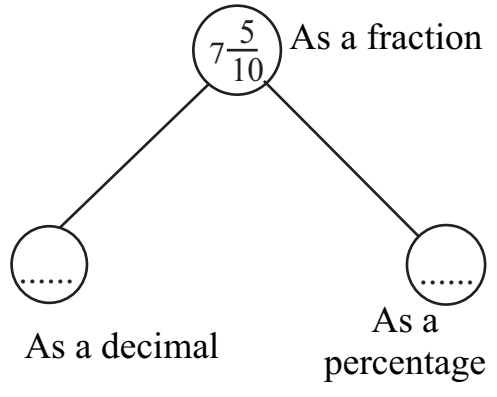
(ii)



(iii)



(iv)



(3) Write each of the following decimals as a percentage.

(i)	0.8	(ii)	0.35	(iii)	1.25
(iv)	2.75	(v)	3.125	(vi)	0.275
(vii)	0.065	(viii)	0.005	(ix)	0.75
(x)	0.755				

Summary

- A percentage can be written as a fraction with denominator 100.
- The sign % is usually used instead of the word percent (A percentage is symbolized by %)
  $1\% = \frac{1}{100}$
- It is easy to convert a fraction or a decimal to a percentage by using equivalent fractions.
- Decimals can also be converted to percentage by multiplying by 100%.