Per cent he travelled by train of total journey

$$=\left(\frac{200}{250}\times 100\right)\% = 80\%$$

CONVERSION BETWEEN PERCENTAGE AND RATIO

Percentages into Ratios

MUST KNOW

To express a percentage as a ratio, first convert the given percentage into a fraction in its simplest form and then to a ratio.

Problem 12 : Express the following percentage as ratios.
(a) 22% (b) 12.4%

Solution : (a) $22\% = \frac{22}{100} = \frac{11}{50} = 11:50$

(b) $12.4\% = \frac{12.4}{100} = \frac{124}{1000} = \frac{31}{250} = 31:250$

Ratios into Percentages

MUST KNOW

To convert a ratio into a percentage, first convert the given ratio into a fraction and then to a percentage.

Problem 13 : Express the following ratios as percentages.
(a) 1 : 5 (b) 20 : 50

Solution : (a) $1:5 = \frac{1}{5} = \left(\frac{1}{5}\times 100\right)\% = 20\%$

(b) $20:50 = \frac{20}{50} = \left(\frac{20}{50}\times 100\right)\% = 40\%$

PERCENTAGE CHANGE

To quantify an increase or decrease as a percentage, we can use the following formulae:

Percentage increase

$$=\frac{\text{New measure}-\text{Old measure}}{\text{Old measure}}\times 100\%$$

Percentage decrease

$$=\frac{\text{Old measure}-\text{New measure}}{\text{Old measure}}\times 100\%$$

Problem 14 : A test was qualified by 6 students this year and 4 students last year. What is the per cent increase?

Solution : The increase in the number of students qualified $= 6-4 = 2$

Percentage increase

$$=\frac{\text{amount of change}}{\text{original amount or base}}\times 100$$

$$=\frac{2}{4}\times 100$$

$= 50\%$ increased.

EXERCISE 7.1

1. Convert the given number to per cent :

(a) $\frac{2}{10}$ (b) $\frac{5}{4}$ (c) $\frac{2}{9}$ (d) $\frac{6}{13}$

(e) 0.13 (f) 2.53 (g) 0.09 (h) 13.26

2. Find the following :

(a) 10% of 200 (b) 15% of 600 (c) 25% of 350

3. Express the following per cent as fractions :
   (a) 26% (b) $3\frac{1}{4}\%$ (c) 105%

4. Find the number whose :
   (a) 12.5% is 1000 (b) 25% is 70

5. Find the ratio of the following :
   (a) 3 dozen to 8 dozen
   (b) 24 ruppes to 73 rupees
   (c) 6 months to 11 months
   (d) 3 months to a year
   (e) 65 paise to 5 rupees
   (f) 12 m to 85 cm

6. Which of the following forms a proportion?
   (a) 2, 9, 8, 36 (b) 12, 16, 6, 8 (c) 33, 44, 66, 88

7. Find the value of x for which the following ratios are in proportion :
   (a) $3:5::x:25$ (b) $7:14::x:30$ (c) $75:x::12:72$

8. A person saves 10% of his Salary. If he saves ₹ 400. What is his salary?

9. Find the mean proportion between 25 and 400.

10. Find the third proportion to 1 km 500 m and 300 m.

11. A 25% of a sum of money is ₹ 450. What is the total sum of money?

12. The ratio between the numbers of males and females in an office is 3 : 4. If the number females working in the office is 28, find the number of males working in that office.

13. A Rajat bought a sweater and saved ₹ 20, when discount of 20% is given. What is the price of sweater before discount?

14. A team won 5 games and lost 3 games. What is the ratio of :
   (a) The games won to the games played?
   (b) The games lost to the games won?

PROFIT AND LOSS

Let us recall the following :

- When the Selling Price (S.P.) of an article is more than its Cost Price (C.P.), *i.e.*, the price at which it was bought, a frofit is made.
- When the Selling Price (S.P.) of an article is less than its Cost Price (C.P.), a loss is incurred.
- Expenses like transportation, storage, taxes, etc., known as overheads. Overheads are always added to the cost price before finding the profit or loss.
- Profit or loss is always calculated on the cost price of an article.

MUST KNOW

The profit per cent and loss per cent are always calculated on Cost Price (C.P.) only.

See the following formulae.

1. Profit
   = Selling Price − (Cost Price + Overheads)
2. Loss
   = (Cost Price + Overheads) − Selling