

Maharashtra Board Solutions Class 9-Maths (Part 1): Chapter 4.1- Ratio and Proportion

BOOK SOLUTIONS
CLASS 9
MATHS

CHAPTER 4.1
Ratio and Proportion



Maharashtra Board Solutions→

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Maharashtra Board Solutions Class 9-Maths

(Part 1): Chapter 4.1- Ratio and Proportion

Class 9: Maths Chapter 4.1 solutions. Complete Class 9 Maths Chapter 4.1 Notes.

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Maharashtra Board 9th Maths Chapter 4.1, Class 9 Maths Chapter 4.1 solutions

Question 1.

From the following pairs of numbers, find the reduced form of ratio of first number to second number.

i. 72,60

ii. 38,57

iii. 52,78

Solution:

i. 72, 60

$$\text{Ratio} = 72:60 = 12 \times 6 : 12 \times 5 = 6:5$$

ii. 38, 57

$$\text{Ratio} = 38:57 = 19 \times 2 : 19 \times 3 = 2:3$$

iii. 52, 78

$$\text{Ratio} = 52:78 = 26 \times 2 : 26 \times 3 = 2:3$$

Question 2.

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Find the reduced form of the ratio of the first quantity to second quantity.

i. ₹ 700, ₹ 308

ii. ₹ 14, ₹ 12 and 40 paise

iii. 5 litres, 2500 ml

iv. 3 years 4 months, 5 years 8 months

v. 3.8 kg, 1900 gm

vi. 7 minutes 20 seconds, 5 minutes 6 seconds

Solution:

i. ₹ 700, ₹ 308

$$\text{Ratio} = 700:308 = 28 \times 25 : 28 \times 11 = 25:11$$

ii. ₹ 14, ₹ 12 and 40 paise

$$\text{₹ 14} = 14 \times 100 \text{ paise} = 1400 \text{ paise}$$

$$\text{₹ 12 and 40 paise} = 12 \times 100 \text{ paise} + 40 \text{ paise}$$

$$= (1200 + 40) \text{ paise}$$

$$= 1240 \text{ paise}$$

$$\begin{aligned} \therefore \text{Ratio} &= \frac{\text{₹ 14}}{\text{₹ 12 and 40 paise}} = \frac{1400 \text{ paise}}{1240 \text{ paise}} \\ &= \frac{1400}{1240} = \frac{40 \times 35}{40 \times 31} = \frac{35}{31} = \mathbf{35 : 31} \end{aligned}$$

iii. 5 litres, 2500 ml

$$5 \text{ litres} = 5 \times 1000 \text{ ml} = 5000 \text{ ml}$$

$$\begin{aligned}\therefore \text{Ratio} &= \frac{5 \text{ litres}}{2500 \text{ ml}} = \frac{5000 \text{ ml}}{2500 \text{ ml}} = \frac{5000}{2500} \\ &= \frac{2500 \times 2}{2500 \times 1} = \frac{2}{1} = \mathbf{2 : 1}\end{aligned}$$

iv. 3 years 4 months, 5 years 8 months

3 years 4 months = 3×12 months + 4 months

= (36 + 4) months

= 40 months

5 years 8 months = 5×12 months + 8 months

= (60 + 8) months

= 68 months

$$\begin{aligned}\therefore \text{Ratio} &= \frac{3 \text{ years 4 months}}{5 \text{ years 8 months}} = \frac{40 \text{ months}}{68 \text{ months}} = \frac{40}{68} \\ &= \frac{4 \times 10}{4 \times 17} = \frac{10}{17} = \mathbf{10 : 17}\end{aligned}$$

v. 3.8 kg, 1900 gm

3.8 kg = 3.8×1000 gm = 3800 gm

$$\begin{aligned}\therefore \text{Ratio} &= \frac{3.8 \text{ kg}}{1900 \text{ gm}} = \frac{3800 \text{ gm}}{1900 \text{ gm}} = \frac{3800}{1900} \\ &= \frac{1900 \times 2}{1900 \times 1} = \frac{2}{1} = \mathbf{2 : 1}\end{aligned}$$

vi. 7 minutes 20 seconds, 5 minutes 6 seconds

7 minutes 20 seconds = 7×60 seconds + 20 seconds

= (420 + 20) seconds

= 440 seconds

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5 minutes 6 seconds = 5×60 seconds + 6 seconds

= (300 + 6) seconds

= 306 seconds

$$\begin{aligned}\therefore \text{Ratio} &= \frac{7 \text{ minutes } 20 \text{ seconds}}{5 \text{ minutes } 6 \text{ seconds}} = \frac{440 \text{ seconds}}{306 \text{ seconds}} \\ &= \frac{440}{306} = \frac{2 \times 220}{2 \times 153} = \frac{220}{153} = \mathbf{220 : 153}\end{aligned}$$

Question 3.

Express the following percentages as ratios

i. 75 : 100

ii. 44 : 100

iii. 6.25%

iv. 52: 100

v. 0.64%

Solution:

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$$\begin{aligned}\text{i. Ratio} &= 75 : 100 = \frac{75}{100} = \frac{25 \times 3}{25 \times 4} \\ &= \frac{3}{4} = \mathbf{3 : 4}\end{aligned}$$

$$\begin{aligned}\text{ii. Ratio} &= 44 : 100 = \frac{44}{100} = \frac{4 \times 11}{4 \times 25} \\ &= \frac{11}{25} = \mathbf{11 : 25}\end{aligned}$$

$$\begin{aligned}\text{iii. Ratio} &= 6.25\% = \frac{6.25}{100} = \frac{625}{100 \times 100} \\ &= \frac{25 \times 25}{25 \times 4 \times 25 \times 4} = \frac{1}{16} = \mathbf{1 : 16}\end{aligned}$$

$$\begin{aligned}\text{iv. Ratio} &= 52 : 100 = \frac{52}{100} = \frac{4 \times 13}{4 \times 25} \\ &= \frac{13}{25} = \mathbf{13 : 25}\end{aligned}$$

$$\begin{aligned}\text{v. Ratio} &= 0.64\% = \frac{0.64}{100} = \frac{64}{100 \times 100} \\ &= \frac{4 \times 4 \times 4}{25 \times 4 \times 25 \times 4} = \frac{4}{25 \times 25} \\ &= \frac{4}{625} = \mathbf{4 : 625}\end{aligned}$$

Question 4.

Three persons can build a small house in 8 days. To build the same house in 6 days, how many persons are required?

Solution:

Let the persons required to build a house in 6 days be x.

Days required to build a house and number of persons are in inverse proportion.

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$$\therefore 6 \times x = 8 \times 3$$

$$\therefore 6x = 24$$

$$\therefore x = 4$$

$\therefore$ 4 persons are required to build the house in 6 days.

Question 5.

Convert the following ratios into percentages.

i. 15 : 25

ii. 47 : 50

iii. 710

iv. 546600

v. 716

Solution:

Let 15 : 25 = x %

$$\therefore \frac{15}{25} = \frac{x}{100}$$

$$\therefore x = \frac{15}{25} \times 100 = 15 \times 4 = 60\%$$

$$\therefore 15 : 25 = 60 \%$$

ii. Let 47 : 50 = x%

$$\therefore \frac{47}{50} = \frac{x}{100}$$

$$\therefore x = \frac{47}{50} \times 100 = 47 \times 2 = 94 \%$$

$$\therefore 47 : 50 = 94 \%$$

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iii. Let $710 = x \%$

$$\therefore \frac{7}{10} = \frac{x}{100}$$

$$\therefore x = \frac{7}{10} \times 100 = 7 \times 10 = 70 \%$$

$$\therefore \frac{7}{10} = 70 \%$$

iv. Let $546600 = x \%$

$$\therefore \frac{546}{600} = \frac{x}{100}$$

$$\therefore x = \frac{546}{600} \times 100 = \frac{546}{6} = 91\%$$

$$\therefore \frac{546}{600} = 91 \%$$

v. Let $716 = x \%$

$$\therefore \frac{7}{16} = \frac{x}{100}$$

$$\therefore x = \frac{7}{16} \times 100 = \frac{7}{4} \times 25 = \frac{175}{4} = 43.75\%$$

$$\therefore \frac{7}{16} = 43.75 \%$$

Question 6.

The ratio of ages of Abha and her mother is 2 : 5. At the time of Abha's birth her mother's age was 27 years. Find the present ages of Abha and her mother.

Solution:

The ratio of ages of Abha and her mother is 2 : 5.

Let the common multiple be x.

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∴ Present age of Abha = $2x$ years and

Present age of Abha's mother = $5x$ years

According to the given condition, the age of Abha's mother at the time of Abha's birth = 27 years

$$\therefore 5x - 2x = 27$$

$$\therefore 3x = 27$$

$$\therefore x = 9$$

$$\therefore \text{Present age of Abha} = 2x = 2 \times 9 = 18 \text{ years}$$

$$\therefore \text{Present age of Abha's mother} = 5x = 5 \times 9 = 45 \text{ years}$$

The present ages of Abha and her mother are 18 years and 45 years respectively.

Question 7.

Present ages of Vatsala and Sara are 14 years and 10 years respectively. After how many years the ratio of their ages will become 5 : 4?

Solution:

Present age of Vatsala = 14 years

Present age of Sara = 10 years

After x years,

Vatsala's age = $(14 + x)$ years

Sara's age = $(10 + x)$ years

According to the given condition,

After x years the ratio of their ages will become 5 : 4

$$\therefore \frac{14+x}{10+x} = \frac{5}{4}$$

$$\therefore 4(14 + x) = 5(10 + x)$$

$$\therefore 56 + 4x = 50 + 5x$$

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$$\therefore 56 - 50 = 5x - 4x$$

$$\therefore 6 = x$$

$$\therefore x = 6$$

$\therefore$ After 6 years, the ratio of their ages will become 5 : 4.

Question 8.

The ratio of present ages of Rehana and her mother is 2 : 7. After 2 years, the ratio of their ages will be 1 : 3. What is Rehana's present age ?

Solution:

The ratio of present ages of Rehana and her mother is 2 : 7

Let the common multiple be x.

$\therefore$ Present age of Rehana = 2x years and Present age of Rehana's mother = 7x years

After 2 years,

Rehana's age = (2x + 2) years

Age of Rehana's mother = (7x + 2) years

According to the given condition,

After 2 years, the ratio of their ages will be 1 : 3

$$\therefore 2x+2 : 7x+2 = 1 : 3$$

$$\therefore 3(2x + 2) = 1(7x + 2)$$

$$\therefore 6x + 6 = 7x + 2$$

$$\therefore 6 - 2 = 7x - 6x$$

$$\therefore 4 = x$$

$$\therefore x = 4$$

$\therefore$ Rehana's present age = 2x = 2 x 4 = 8 years

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∴ Rehana's present age is 8 years.



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- Chapter 7.5- Statistics

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The Maharashtra State Board of Secondary and Higher Secondary Education or MSBSHSE (Marathi: महाराष्ट्र राज्य माध्यमिक आणि उच्च माध्यमिक शिक्षण मंडळ), is an **autonomous and statutory body established in 1965**. The board was amended in the year 1977 under the provisions of the Maharashtra Act No. 41 of 1965.

The Maharashtra State Board of Secondary & Higher Secondary Education (MSBSHSE), Pune is an independent body of the Maharashtra Government. There are more than 1.4 million students that appear in the examination every year. The Maha State Board conducts the board examination twice a year. This board conducts the examination for SSC and HSC.

The Maharashtra government established the Maharashtra State Bureau of Textbook Production and Curriculum Research, also commonly referred to as Ebalbharati, in 1967 to take up the responsibility of providing quality textbooks to students from all classes studying under the Maharashtra State Board. MSBHSE prepares and updates the curriculum to provide holistic development for students. It is designed to tackle the difficulty in understanding the

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concepts with simple language with simple illustrations. Every year around 10 lakh students are enrolled in schools that are affiliated with the Maharashtra State Board.

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FAQs

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Who developed the Maharashtra State board books?

As of now, the MSCERT and Balbharti are responsible for the syllabus and textbooks of Classes 1 to 8, while Classes 9 and 10 are under the Maharashtra State Board of Secondary and Higher Secondary Education (MSBSHSE).

How many state boards are there in Maharashtra?

The Maharashtra State Board of Secondary & Higher Secondary Education, conducts the HSC and SSC Examinations in the state of Maharashtra through its nine Divisional Boards located at Pune, Mumbai, Aurangabad, Nasik, Kolhapur, Amravati, Latur, Nagpur and Ratnagiri.

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