



CLASS-7

SUB-MATHS

CHAPTER - 8
Comparing Quantities

Ex.8.1

Question 1. Find the ratio of:

(a) Rs. 5 to 50 paise

(b) 15 kg to 210 g

(c) 9 m to 27 cm

(d) 30 days to 36 hours

Answer: To find ratios, both quantities should be in same unit.

(a) Rs. 5 to 50 paise

⇒ 5 x 100 paise to 50 paise [* Rs. 1 = 100 paise]

⇒ 500 paise to 50 paise

Thus, the ratio is = $\frac{500}{50} = \frac{10}{1} = 10 : 1$

(b) 15 kg to 210 g

⇒ 15 x 1000 g to 210 g [* 1 kg = 1000 g]

⇒ 15000 g to 210 g

Thus, the ratio is = $\frac{15000}{210} = \frac{500}{7} = 500 : 7$

(c) 9 m to 27 cm

⇒ 9 x 100 cm to 27 cm [* 1 m = 100 cm]

⇒ 900 cm to 27 cm

Thus, the ratio is = $\frac{900}{27} = \frac{100}{3} = 100 : 3$

(d) 30 days to 36 hours

⇒ 30 x 24 hours to 36 hours [∵ 1 day = 24 hours]

⇒ 720 hours to 36 hours

Thus, the ratio is = $\frac{720}{36} = \frac{20}{1} = 20 : 1$

Question 2. In a computer lab, there are 3 computers for every 6 students. How many computers will be needed for 24 students?

Answer: 6 students needed = 3 computers

Therefore 1 student needs = $\frac{3}{6}$ computers

24 students needs = $\frac{3}{6}$ times 24 = 12 computers

Thus, 12 computers will be needed for 24 students.

Question 3. Population of Rajasthan = 570 lakhs and population of U.P. = 1660 lakhs. Area of Rajasthan = 3 lakh km^2 and area of U.P. = 2 lakh km^2 .

(i) How many people are there per km^2 in both states?

(ii) Which state is less populated?

Answer: (i) People present per $km^2 = \frac{\text{Population}}{\text{Area}}$

In Rajasthan = $\frac{570 \text{ lakhs}}{3 \text{ lakhs } km^2} = 190 \text{ people per } km^2$

In U.P. $\frac{1660 \text{ lakhs}}{2 \text{ lakh } km^2}$
= 830 people per km^2

(ii) Rajasthan is less populated.

Ex. 8.2)

Question 1. Convert the given fractional numbers to percent:

(a) $\frac{1}{8}$

(b) $\frac{5}{4}$

(c) $\frac{3}{40}$

(d) $\frac{2}{7}$

Answer: (a) $\frac{1}{8} = \frac{1}{8} \times 100\% = \frac{25}{2}\% = 12.5\%$

(b) $\frac{5}{4} = \frac{5}{4} \times 100\% = 5 \times 25\% = 125\%$

(c) $\frac{3}{40} = \frac{3}{40} \times 100\% = \frac{3}{4} \times 5\% = \frac{15}{2}\%$

(d) $\frac{2}{7} = \frac{2}{7} \times 100\% = \frac{200}{7}\% = 28\frac{4}{7}\%$

Question 2. Convert the given decimal fractions to percents:

- (a) 0.65 (b) 2.1 (c) 0.02 (d) 12.35

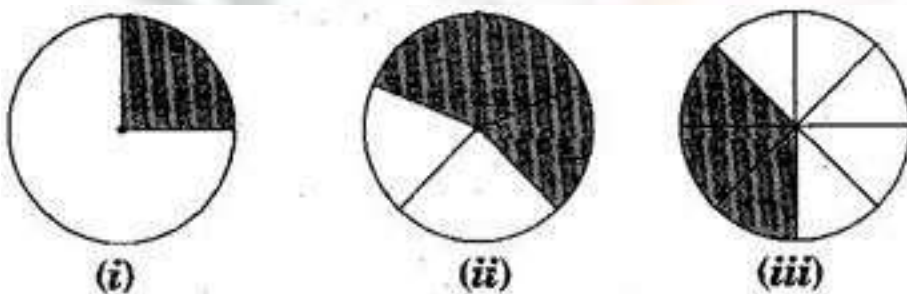
Answer: (a) $0.65 = \frac{65}{100} \times 100\% = 65\%$

(b) $2.1 = \frac{21}{10} \times 100\% = 210\%$

(c) $0.02 = \frac{2}{100} \times 100\% = 2\%$

(d) $12.35 = \frac{1235}{100} \times 100\% = 1235\%$

Question 3. Estimate what part of the figures is coloured and hence find the percent which is coloured:



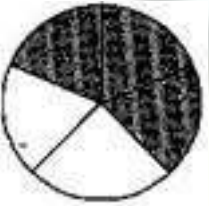
Answer: (i) Coloured part = $\frac{1}{4}$

\therefore Percent of coloured part = $\frac{1}{4} \times 100\% = 25\%$



(ii) Coloured part = $\frac{3}{5}$

$$\therefore \text{Percent of coloured part} = \frac{3}{5} \times 100\% = 60\%$$



(iii) Coloured part = $\frac{3}{8}$

$$\therefore \text{Percent of coloured part} = \frac{3}{8} \times 100\% = \frac{3}{2} \times 25\% = 37.5\%$$



- Question 4.** Find: (a) 15% of 250
 (b) 1% of 1 hour
 (c) 20% of Rs. 2500
 (d) 75% of 1 kg

Answer: (a) 15% of 250 = $\frac{15}{100} \times 250 = 15 \times 2.5 = 37.5$

(b) 1% of 1 hours = 1% of 60 minutes = 1% of (60 x 60) seconds

$$\frac{1}{100} \times 60 \times 60 = 6 \times 6 = 36 \text{ seconds}$$

(c) 20% of Rs. 2500 = $\frac{20}{100} \times 2500 = 20 \times 25 = \text{Rs. } 500$

(d) 75% of 1 kg = 75% of 1000 g = $\frac{75}{100} \times 1000 = 750 \text{ g} = 0.750 \text{ kg}$

Question 5. Find the whole quantity if:

(a) 5% of it is 600

(b) 12% of it is Rs. 1080

(c) 40% of it is 500 km

(d) 70% of it is 14 minutes

(e) 8% of it is 40 liters

Answer: Let the whole quantity be x in given questions:

(a) 5% of $x = 600$

$$\Rightarrow \frac{5}{100} \times x = 600$$

$$\Rightarrow x = \frac{600 \times 100}{5} = 12,000$$

(b) 12% of $x = \text{Rs. } 1080$

$$\Rightarrow \frac{12}{100} \times x = 1080$$

$$\Rightarrow x = \frac{1080 \times 100}{12} = \text{Rs. } 9,000$$

(c) 40% of $x = 500 \text{ km}$

$$\Rightarrow \frac{40}{100} \times x = 500$$

$$\Rightarrow x = \frac{500 \times 100}{40} = 1,250 \text{ km}$$

(d) 70% of $x = 14 \text{ minutes}$

$$\Rightarrow \frac{70}{100} \times x = 14$$

$$\Rightarrow x = \frac{14 \times 100}{70} = 20 \text{ minutes}$$

(e) 8% of $x = 40 \text{ liters}$

$$\Rightarrow \frac{8}{100} \times x = 40$$

$$\Rightarrow x = \frac{40 \times 100}{8} = 500 \text{ liters}$$

Question 6. Convert given percents to decimal fractions and also to fractions in simplest forms:

(a) 25%

(b) 150%

(c) 20%

(d) 5%

Answer:

S.No.	Percents	Fractions	Simplest form	Decimal form
(a) (b)	25%	$\frac{25}{100}$	$\frac{1}{4}$	0.25
(c)	150%	$\frac{150}{100}$	$\frac{3}{2}$	1.5
(d)	20%	$\frac{20}{100}$	$\frac{1}{5}$	0.2

Question 7. In a city, 30% are females, 40% are males and remaining are children. What percent are children?

Answer: Given: Percentage of females = 30% Percentage

of males = 40%

Total percentage of females and males = $30 + 40 = 70\%$

Percentage of children = Total percentage – Percentage of males and females

= $100\% - 70\%$

= 30%

Hence, 30% are children.

Question 8. Out of 15,000 voters in a constituency, 60% voted. Find the percentage of voters who did not vote. Can you now find how many actually did not vote?

Answer: Total voters = 15,000

Percentage of voted candidates = 60%

Percentage of not voted candidates = $100\% - 60\% = 40\%$

Actual candidates, who did not vote = 40% of 15000 = $\frac{40}{100} \times 15000$

= 6,000 Hence, 6,000 candidates did not vote.

Question 9. Meeta saves Rs. 400 from her salary. If this is 10% of her salary. What is her salary?

Answer: Let Meera's salary be Rs. x .

Now, 10% of salary = Rs. 400

$$\Rightarrow 10\% \text{ of } x = \text{Rs. } 400$$

$$\Rightarrow \frac{10}{100} \times x = 400$$

$$\Rightarrow x = \frac{400 \times 100}{10}$$

$$\Rightarrow x = 4,000$$

Hence, Meera's salary is Rs. 4,000.

Question 10. A local cricket team played 20 matches in one season. It won 25% of them. How many matches did they win?

Answer: Number of matches played by cricket team = 20

Percentage of won matches = 25%

$$\text{Total matches won by them} = 25\% \text{ of } 20 = \frac{25}{100} \times 20$$

= 5 Hence, they won 5 matches.

Ex. 8.3

Question 1. Tell what is the profit or loss in the following transactions. Also find profit percent or loss percent in each case.

- Gardening shears bought for Rs. 250 and sold for Rs. 325.
- A refrigerator bought for Rs. 12,000 and sold for Rs. 13,500.
- A cupboard bought for Rs. 2,500 and sold for Rs. 3,000.

(d) A skirt bought for Rs. 250 and sold for Rs. 150.

Answer: (a) Cost price of gardening shears = Rs. 250

Selling price of gardening shears = Rs. 325

Since, S.P. > C.P., therefore here is profit.

$$\therefore \text{Profit} = \text{S.P.} - \text{C.P.} = 325 - 250 = \text{Rs. } 75$$

$$\text{Now Profit\%} = \frac{\text{Profit}}{\text{C.P.}} \times 100 = \frac{75}{250} \times 100 = 30\%$$

Therefore,

$$\text{Profit} = \text{Rs. } 75 \text{ and Profit\%} = 30\%$$

(b) Cost price of refrigerator = Rs. 12,000

Selling price of refrigerator = Rs. 13,500

Since, S.P. > C.P., therefore here is profit.

$$\therefore \text{Profit} = \text{S.P.} - \text{C.P.} = 13500 - 12000 = \text{Rs. } 1,500$$

$$\text{Now Profit\%} = \frac{\text{Profit}}{\text{C.P.}} \times 100 = \frac{1500}{12000} \times 100 = 12.5\%$$

Therefore, Profit = Rs. 1,500 and Profit% = 12.5%

(c) Cost price of cupboard = Rs. 2,500

Selling price of cupboard = Rs. 3,000

Since, S.P. > C.P., therefore here is profit.

$$\therefore \text{Profit} = \text{S.P.} - \text{C.P.} = 3,000 - 2,500 = \text{Rs. } 500$$

$$\text{Now Profit\%} = \frac{\text{Profit}}{\text{C.P.}} \times 100 = \frac{500}{2500} \times 100 = 20\%$$

Therefore, Profit = Rs. 500 and Profit% = 20%

(b) Cost price of skirt = Rs. 250

Selling price of skirt = Rs. 150

Since, C.P. > S.P., therefore here is loss.

$$\therefore \text{Loss} = \text{C.P.} - \text{S.P.} = 250 - 150 = \text{Rs. } 100$$

$$\text{Now Loss\%} = \frac{\text{Loss}}{\text{C.P.}} \times 100 = \frac{100}{250} \times 100 = 40\%$$

Therefore, Profit = Rs. 100 and Profit% = 40%

Question 2. Convert each part of the ratio to percentage:

(a) 3 : 1

(b) 2 : 3 : 5

(c) 1 : 4

(d) 1 : 2 : 5

Answer: (a) 3 : 1

Total part = 3 + 1 = 4

Therefore, Fractional part $\frac{3}{4} : \frac{1}{4}$

$$\Rightarrow \text{Percentage of parts} = \frac{3}{4} \times 100 : \frac{1}{4} \times 100$$

$$\Rightarrow \text{Percentage of parts} = 75\% : 25\%$$

(b) 2 : 3 : 5

Total part = 2 + 3 + 5 = 10

Therefore, Fractional part = $\frac{2}{10} : \frac{3}{10} : \frac{5}{10}$

$$\Rightarrow \text{Percentage of parts} = \frac{2}{10} \times 100 : \frac{3}{10} \times 100 : \frac{5}{10} \times 100$$

$$\Rightarrow \text{Percentage of parts} = 20\% : 30\% : 50\%$$

(c) 1 : 4

Total part = 1 + 4 = 5

Therefore, Fractional part $\frac{1}{5} : \frac{4}{5}$

$$= \frac{1}{5} : \frac{4}{5}$$

$$\Rightarrow \text{Percentage of parts} = \frac{1}{5} \times 100 : \frac{4}{5} \times 100$$

$$\Rightarrow \text{Percentage of parts} = 20% :$$

80%

(d) 1 : 2 : 5

Total part = 1 + 2 + 5 = 8

Therefore, Fractional part $\frac{1}{8} : \frac{2}{8} : \frac{5}{8}$

$$\Rightarrow \text{Percentage of parts} = \frac{1}{8} \times 100 : \frac{2}{8} \times 100 : \frac{5}{8} \times 100$$

$$\Rightarrow \text{Percentage of parts} = 12.5% : 25% : 62.5%$$

Question 3. The population of a city decreased from 25,000 to 24,500. Find the percentage decrease.

Answer: The population of a city decreased from 25,000 to 24,500.

Population decreased = 25,000 - 24,500 = 500

$$\text{Decreased Percentage} = \frac{\text{Population decreased}}{\text{Original population}} \times 100 = \frac{500}{25000} \times 100 = 2\%$$

Hence, the percentage decreased is 2%.

Question 4. Arun bought a car for Rs. 3,50,000. The next year, the price went up to Rs. 3,70,000. What was the percentage of price increase?

Answer: Increased in price of a car from Rs. 3,50,000 to Rs.

3,70,000. Amount change = Rs. 3,70,000 - Rs. 3,50,000 = Rs. 20,000.

$$\text{Therefore, Increased percentage} = \frac{\text{Amount of change}}{\text{Original amount}} \times 100$$

$$= \frac{20000}{350000} \times 100 = 5\frac{5}{7}\%$$

Hence, the percentage of price increased is $5\frac{5}{7}\%$.

Question 5. I buy a T.V. for Rs. 10,000 and sell it at a profit of 20%. How much money do I get for it?

Answer: The cost price of T.V. = Rs. 10,000 Profit percent = 20%

Now, Profit = Profit% of C.P.

$$= \frac{20}{100} \times 10000 = \text{Rs. } 2,000$$

Selling price = C.P. + Profit

$$= 10,000 + 2,000 = \text{Rs. } 12,000$$

Hence, he gets Rs. 12,000 on selling his T.V.

Question 6. Juhi sells a washing machine for Rs. 13,500. She loses 20% in the bargain. What was the price at which she bought it?

Answer: Selling price of washing machine = Rs. 13,500

Loss percent = 20%

Let the cost price of washing machine be Rs. x .

Since, Loss = Loss% of C.P.

$$\Rightarrow \text{Loss} = 20\% \text{ of Rs. } x = \frac{20}{100} \times x = \frac{x}{5}$$

Therefore, S.P. = C.P. - Loss

$$\Rightarrow 13500 = x - \frac{x}{5} \Rightarrow 13500 = \frac{4x}{5}$$

$$\Rightarrow x = \frac{13500 \times 5}{4} = \text{Rs. } 16,875$$

Hence, the cost price of washing machine is Rs. 16,875.

Question 7. (i) Chalk contains Calcium, Carbon and Oxygen in the ratio 10 : 3 : 12. Find the

percentage of Carbon in chalk.

(ii) If in a stick of chalk, Carbon is 3 g, what is the weight of the chalk stick?

Answer: (i) Given ratio = 10 : 3 : 12

Total part = 10 + 3 + 12 = 25

Part of Carbon = $\frac{3}{25}$

Percentage of Carbon part in chalk = $\frac{3}{25} \times 100 = 12\%$

(ii) Quantity of Carbon in chalk stick = 3 g

Let $\frac{3}{25}$

the weight of chalk be x g.

Then, 12% of $x = 3$

$$\Rightarrow \frac{12}{100} \times x = 3$$

$$\Rightarrow x = \frac{3 \times 100}{12} = 25 \text{ g}$$

Hence, the weight of chalk stick is 25 g.

Question 8. Amina buys a book for Rs. 275 and sells it at a loss of 15%. How much does she sell it for?

Answer: The cost price of a book = Rs.

275 Loss percent = 15%

$$\text{Loss} = \text{Loss\% of C.P.} = 15\% \text{ of Rs. } 275 = \frac{15}{100} \times 275 = \text{Rs. } 41.25$$

$$\text{Therefore, S.P.} = \text{C.P.} - \text{Loss} = 275 - 41.25 = \text{Rs. } 233.75$$

Hence, Amina sells a book for Rs. 233.75.

Question 9. Find the amount to be paid at the end of 3 years in each case:

(a) Principal = Rs. 1,200 at 12% p.a.

(b) Principal = Rs. 7,500 at 5% p.a.

Answer: (a) Here, Principal (P) = Rs. 1,200, Rate (R) = 12% p.a., Time (T) = 3 years

$$\text{Simple Interest} = \frac{P \times R \times T}{100} = \frac{1200 \times 12 \times 3}{100} = \text{Rs. } 432$$

Now, Amount = Principal + Simple Interest = 1200 + 432 = Rs. 1,632

(b) Here, Principal (P) = Rs. 7,500, Rate (R) = 5% p.a., Time (T) = 3 years

$$\text{Simple Interest} = \frac{P \times R \times T}{100} = \frac{7500 \times 5 \times 3}{100} = \text{Rs. } 1,125$$

Now, Amount = Principal + Simple Interest = 7,500 + 1,125 = Rs. 8,625

Question 10. What rate gives Rs. 280 as interest on a sum of Rs. 56,000 in 2 years?

Answer: Here, Principal (P) = Rs. 56,000, Simple Interest (S.I.) = Rs. 280, Time (T) = 2 years

$$\text{Simple Interest} = \frac{P \times R \times T}{100}$$

$$\Rightarrow 280 = \frac{56000 \times R \times 2}{100}$$

$$\Rightarrow R = \frac{280 \times 100}{56000 \times 2} = 0.25\%$$

Hence, the rate of interest on sum is 0.25%.

Question 11. If Meena gives an interest of Rs. 45 for one year at 9% rate p.a. What is the sum she has borrowed?

Answer: Simple Interest = Rs. 45, Rate (R) = 9% p.a., Time (T) = 1 year

$$\text{Simple Interest} = \frac{P \times R \times T}{100}$$

$$\Rightarrow 45 = \frac{P \times 9 \times 1}{100}$$

$$\Rightarrow P = \frac{45 \times 100}{9 \times 1} = \text{Rs. } 500$$

Hence, she borrowed Rs. 500.