

Mathematics

(Chapter – 8) (Comparing Quantities) (Class – VII)

Exercise 8.1

Question 1:

Find the ratio of:

(a) ₹5 to 50 paise

(b) 15 kg to 210 g

(c) 9 m to 27 cm

(d) 30 days to 36 hours

Answer 1:

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

(a) ₹5 to 50 paise

$$\Rightarrow 5 \times 100 \text{ paise to } 50 \text{ paise}$$

$$[\because ₹ 1 = 100 \text{ paise}]$$

$$\Rightarrow 500 \text{ paise to } 50 \text{ paise}$$

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

(b) 15 kg to 210 g

$$\Rightarrow 15 \times 1000 \text{ g to } 210 \text{ g}$$

$$[\because 1 \text{ kg} = 1000 \text{ g}]$$

$$\Rightarrow 15000 \text{ g to } 210 \text{ g}$$

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

(c) 9 m to 27 cm

$$\Rightarrow 9 \times 100 \text{ cm to } 27 \text{ cm}$$

$$[\because 1 \text{ m} = 100 \text{ cm}]$$

$$\Rightarrow 900 \text{ cm to } 27 \text{ cm}$$

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

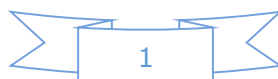
(d) 30 days to 36 hours

$$\Rightarrow 30 \times 24 \text{ hours to } 36 \text{ hours}$$

$$[\because 1 \text{ day} = 24 \text{ hours}]$$

$$\Rightarrow 720 \text{ hours to } 36 \text{ hours}$$

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



Question 2:

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

Answer 2:

$$\therefore 6 \text{ students need} = 3 \text{ computers}$$

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

$$\therefore 24 \text{ students need} = \frac{3}{6} \times 24 = 12 \text{ computers}$$

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 km² and area of U.P. = 2 lakh km².

(i) How many people are there per km² in both states?

(ii) Which state is less populated?

Answer 3:

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

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

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

(ii) Rajasthan is less populated.

Exercise 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 1:

(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) $\frac{3}{40} = \frac{3}{40} \times 100\% = \frac{3}{2} \times 5\% = \frac{15}{2}\% = 7.5\%$

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

Question 2:

Convert the given decimal fractions to per cents:

(a) 0.65

(b) 2.1

(c) 0.02

(d) 12.35

Answer 2:

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

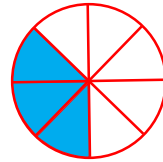
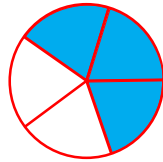
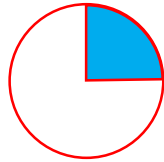
(b) $2.1 = \frac{2.1}{100} \times 100\% = 210\%$

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

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

Question 3:

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



Answer 3:

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



(ii) Coloured part = $\frac{3}{5}$
 $\therefore$ Percent of coloured part = $\frac{3}{5} \times 100\% = 60\%$



(iii) Coloured part = $\frac{3}{8}$
 $\therefore$ 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 ₹2500

(d) 75% of 1 kg

Answer 4:

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

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

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

Question 5:

Find the whole quantity if:

(a) 5% of it is 600

(b) 12% of it is ₹1080

(c) 40% of it is 500 km

(d) 70% of it is 14 minutes

(e) 8% of it is 40 litres



Answer 5:

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 $x = ₹1080$

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

$$\Rightarrow x = \frac{1080 \times 100}{12} = ₹ 9,000$$

(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 $x = 40 \text{ litres}$

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

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

Question 6:

Convert given per cents to decimal fractions and also to fractions in simplest forms:

(a) 25%

(b) 150%

(c) 20%

(d) 5%

Answer 6:

S. No.	Per cents	Fractions	Simplest form	Decimal form
(a)	25%	$\frac{25}{100}$	$\frac{1}{4}$	0.25
(b)	150%	$\frac{150}{100}$	$\frac{3}{2}$	1.5
(c)	20%	$\frac{20}{100}$	$\frac{1}{5}$	0.2
(d)	5%	$\frac{5}{100}$	$\frac{1}{20}$	0.05

Question 7:

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

Answer 7:

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 8:

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 ₹ 400 from her salary. If this is 10% of her salary. What is her salary?

 Answer 9:

Let Meera's salary be ₹ x .

Now, 10% of salary = ₹ 400

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

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

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

$$\Rightarrow x = 4,000$$

Hence, Meera's salary is ₹ 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 10:

Number of matches played by cricket team = 20

Percentage of won matches = 25%

Total matches won by them = 25% of 20

$$\begin{aligned} &= \frac{25}{100} \times 20 \\ &= 5 \end{aligned}$$

Hence, they won 5 matches.

Exercise 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.

- (a) Gardening shears bought for ₹ 250 and sold for ₹ 325.
- (b) A refrigerator bought ₹12,000 and sold at ₹ 13,500.
- (c) A cupboard bought for ₹ 2,500 and sold at ₹ 3,000.
- (d) A skirt bought for ₹ 250 and sold at ₹ 150.

Answer 1:

- (a) Cost price of gardening shears = ₹ 250

Selling price of gardening shears = ₹ 325

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

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

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

Therefore, Profit = ₹75 and Profit% = 30%

- (b) Cost price of refrigerator = ₹ 12,000

Selling price of refrigerator = ₹13,500

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

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

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

Therefore, Profit = ₹1,500 and Profit% = 12.5%

- (c) Cost price of cupboard = ₹ 2,500

Selling price of cupboard = ₹ 3,000

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

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

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

Therefore, Profit = ₹ 500 and Profit% = 20%

(d) Cost price of skirt = ₹ 250

Selling price of skirt = ₹ 150

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

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

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

Therefore, Profit = ₹ 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 2:

(a) 3 : 1

$$\text{Total part} = 3 + 1 = 4$$

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

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

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

(b) 2 : 3 : 5

$$\text{Total part} = 2 + 3 + 5 = 10$$

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

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

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

(c) 1 : 4

$$\text{Total part} = 1 + 4 = 5$$

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

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

$$\Rightarrow \text{Percentage of parts} = 20\% : 80\%$$

(d) 1 : 2 : 5

Total part = 1 + 2 + 5 = 8

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

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

$\Rightarrow$ 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 3:

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

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

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

Hence, the percentage decreased is 2%.

Question 4:

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



Answer 4:

Increased in price of a car from ₹ 3,50,000 to ₹ 3,70,000.

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

$$\begin{aligned}\text{Therefore, Increased percentage} &= \frac{\text{Amount of change}}{\text{Original amount}} \times 100 \\ &= \frac{20000}{350000} \times 100 = 5\frac{5}{7}\%\end{aligned}$$

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

Question 5:

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

 Answer 5:

The cost price of T.V. = ₹ 10,000

Profit percent = 20%

Now, Profit = Profit% of C.P.

$$\begin{aligned} &= \frac{20}{100} \times 10000 \\ &= ₹ 2,000 \end{aligned}$$

Selling price = C.P. + Profit = ₹10,000 + ₹2,000 = ₹ 12,000

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

Question 6:

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

 Answer 6:

Selling price of washing machine = ₹13,500

Loss percent = 20%

Let the cost price of washing machine be ₹ x .

Since, Loss = Loss% of C.P.

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

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

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

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

$$\Rightarrow x = \frac{13500 \times 5}{4} = ₹16,875$$

Hence, the cost price of washing machine is ₹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 7:

- (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 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 ₹275 and sells it at a loss of 15%. How much does she sell it for?

Answer 8:

The cost of a book = ₹275
Loss percent = 15%
Loss = Loss% of C.P. = 15% of ₹275
 $= \frac{15}{100} \times 275 = ₹41.25$
Therefore, S.P. = C.P. – Loss = ₹275 – ₹41.25 = ₹233.75
Hence, Amina sells a book for ₹233.75.

Question 9:

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

(a) Principal = ₹1,200 at 12% p.a.

(b) Principal = ₹ 7,500 at 5% p.a.



Answer 9:

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

$$\begin{aligned}\text{Simple Interest} &= \frac{P \times R \times T}{100} = \frac{1200 \times 12 \times 3}{100} \\ &= ₹ 432\end{aligned}$$

$$\begin{aligned}\text{Now, Amount} &= \text{Principal} + \text{Simple Interest} \\ &= ₹1200 + ₹432 \\ &= ₹1,632\end{aligned}$$

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

$$\begin{aligned}\text{Simple Interest} &= \frac{P \times R \times T}{100} = \frac{7500 \times 5 \times 3}{100} \\ &= ₹1,125\end{aligned}$$

$$\begin{aligned}\text{Now, Amount} &= \text{Principal} + \text{Simple Interest} \\ &= ₹7,500 + ₹1,125 \\ &= ₹ 8,625\end{aligned}$$

Question 10:

What rate gives ₹ 280 as interest on a sum of ₹ 56,000 in 2 years?



Answer 10:

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

$$\begin{aligned}\text{Simple Interest} &= \frac{P \times R \times T}{100} \\ \Rightarrow 280 &= \frac{56000 \times R \times 2}{100} \\ \Rightarrow R &= \frac{280 \times 100}{56000 \times 2} \\ \Rightarrow R &= 0.25\%\end{aligned}$$

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

Question 11:

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

 Answer 11:

Simple Interest = ₹45, Rate (R) = 9% p.a., Time (T) = 1 years

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

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

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

$$\Rightarrow P = ₹ 500$$

Hence, she borrowed ₹ 500.