

# 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

⇒ 5 x 100 paise to 50 paise

[∵ ₹ 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 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 km<sup>2</sup> and area of U.P. = 2 lakh km<sup>2</sup>.

(i) How many people are there per km<sup>2</sup> 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)  $0.65 = \frac{65}{100} \times 100\% = 65\%$

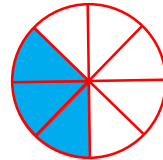
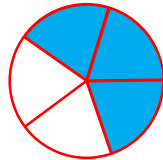
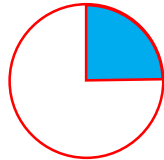
(b)  $2.1 = \frac{2.1}{1} \times 100\% = 210\%$

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

(d)  $12.35 = \frac{12.35}{1} \times 100\% = 1235\%$

### 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

(c) 40% of it is 500 km

(e) 8% of it is 40 litres

(b) 12% of it is ₹1080

(d) 70% of it is 14 minutes

### 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

$$= \frac{25}{100} \times 20$$

$$= 5$$

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.

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

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

$$= \frac{100}{250} \times 100 = 40\%$$

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

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

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

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

$$\Rightarrow R = 0.25\%$$

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.