CBSE NCERT Solutions for Class 7 Mathematics Chapter 8

Back of Chapter Questions

Exercise 8.1

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

Solution:

(a) To find ratio, both values must be in same unit.

Since, ₹1 = 100 paise

Hence, ₹5 = 500 paise

Hence, the ratio of ₹5 to 50 paise $= \frac{₹5}{50 \text{ paise}} = \frac{500\ paise}{50\ paise} = \frac{10}{1} = 10:1$

(b) To find ratio, both values must be in same unit.

Since, 1 kg = 1000 g

Hence, 15 kg = 15000 g

Hence, the ratio of 15 kg to 210 g $= \frac{15 \text{ kg}}{210 \text{ g}} = \frac{15000g}{210g} = \frac{500}{7} = 500:7$

(c) To find ratio, both values must be in same unit.

Since, 1 m = 100cm

Hence, 9 m = 900cm

Hence, the ratio of 9 m to 27 cm $= \frac{9\ m}{27\ cm} = \frac{900\ cm}{27\ cm} = \frac{100}{3} = 100:3$

(d) To find ratio, both values must be in same unit.

Since, 1 day= 24 hours

Hence, 30 day= 30 × 24 hours

Hence, the ratio of 30 days to 36 hours $= \frac{30\times24\ hours}{36\ hours} = \frac{720}{36} = 20:1$

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

Solution:

Given, for 6 students 3 computers are neede((d)

$\because$ 6 students need= 3 computers

$\therefore$ 1 student need= $\frac{3}{6}$ computer

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

Thus, 12 computers will be needed for 24 students.

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

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

(ii) Which State is less populated?

Solution:

Given, Population of Rajasthan = 570 lakhs and Area of Rajasthan = 3 lakh km^2

Population of UP = 1660 lakhs and area of UP = 2 lakh km^2.

(i) $\because$ Number of people per km^2 = $\frac{population}{area}$

Therefore, in Rajasthan number of people per km^2 = $\frac{570\ lakhs}{3\ lakhs\ km^2}$ = 190 people per km^2

and, in UP number of people per km^2 = $\frac{1660\ lakhs}{2\ lakhs\ km^2}$ = 830 people per km^2

Hence, in Rajasthan 190 *people per* km^2 and in UP 830 people per km^2 are present.

(ii) Since number of people per km^2 is less in Rajasthan. Hence, Rajasthan is less populating (d)

Exercise 8.2

1. Convert the given fractional numbers to per cents.

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

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

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

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

Solution:

To convert a fraction into percentage, multiply it by 100.

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

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

(c) Hence, $\frac{3}{40} = \frac{3}{40} \times 100\% = \frac{30}{4}\% = 7.5\%$

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

2. Convert the given decimal fractions to per cents.

(a) 0.65

(b) 2.1

(c) 0.02

(d) 12.35

Solution:

To convert a decimal fraction to per cents, multiply it by 100.

(a) Hence, $0.65 = 0.65 \times 100\% = 65\%$

(b) Hence, $2.1 = 2.1 \times 100\% = 210\%$

(c) Hence, $0.02 = 0.02 \times 100\% = 2\%$

(d) Hence, $12.35 = 12.35 \times 100\% = 1235\%$

3. Estimate what part of the figures is coloured and hence find the per cent which is coloured

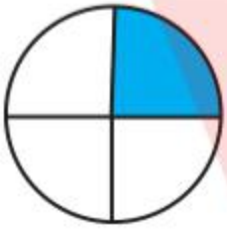
(i)

(ii)

(iii)

Solution:

(i)



In the figure, there is total 4 part where coloured part is 1. We can clearly see that coloured part is $\frac{1}{4}$.

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

(ii)

In the figure, there is total 5 part where coloured part is 3. We can clearly see that coloured part is $\frac{3}{5}$.

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

(iii)

In the figure, there is total 8 part where coloured part is 3. We can clearly see that coloured part is $\frac{3}{8}$.

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

4. Find:

(a) 15% of 250

(b) 1% of 1 hour

(c) 20% of ₹2500

(d) 75% of 1 kg

Solution:

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

(b) 1% of 1 hour $= \frac{1}{100} \times (60 \times 60)$ seconds $= 36$ seconds [$\because$1 hour $= (60 \times 60)$seconds]

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

(d) 75% of 1 kg $= \frac{75}{100} \times 1000g = 750g$ [$\because$1 kg = 1000g]

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.

Solution:

Let the whole quantity be x.

(a) Given, 5% of $x = 600$

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

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

$$\Rightarrow x = 12000$$

Hence, the whole quantity is 12000.

(b) Given, 12% of $x = ₹1080$

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

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

$$\Rightarrow x = ₹9000$$

Hence, the whole quantity is ₹9000.

(c) Given, 40% of $x = 500\ km$

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

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

$$\Rightarrow x = 1250\ km$$

Hence, the whole quantity is $1250\ km$.

(d) Given, 70% of $x = 14$ minutes

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

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

$$\Rightarrow x = 20 \text{ minutes}$$

Hence, the whole quantity is 20 minutes.

(e) Given, 8% of $x = 40$ litres

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

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

$$\Rightarrow x = 500 \text{ litres}$$

Hence, the whole quantity is 500 litres.

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

(a) 25%

(b) 150%

(c) 20%

(d) 5%

Solution:

(a) $25\% = \frac{25}{100} = \frac{1}{4} = 0.25$

Hence, decimal fraction of 25% is 0.25 and fraction in simplest form of 25% is $\frac{1}{4}$.

(b) $150\% = \frac{150}{100} = \frac{3}{2} = 1.5$

Hence, decimal fraction of 150% is 1.5 and fraction in simplest form of 150% is $\frac{3}{2}$.

(c) $20\% = \frac{20}{100} = \frac{1}{5} = 0.2$

Hence, decimal fraction of 20% is 0.2 and fraction in simplest form of 20% is $\frac{1}{5}$.

(d) $5\% = \frac{5}{100} = \frac{1}{20} = 0.05$

Hence, decimal fraction of 5% is 0.05 and fraction in simplest form of 5% is $\frac{1}{20}$.

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

Solution:

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.

8. Out of 15,000 voters in a constituency, 60% vote((d) Find the percentage of voters who did

not vote. Can you now find how many actually did not vote?

Solution:

Given, total number of voters = 15,000

Percentage of voters who voted = 60%

Percentage of candidates who did not vote = (100 – 60) % = 40%

Actual voters, who did not vote = 40% of 15000

$= \frac{40}{100} \times 15000$

$= 6000$

Hence, 6,000 voters did not vote.

9. Meeta saves ₹4000 from her salary. If this is 10% of her salary. What is her salary?

Solution:

Let Meeta's salary be ₹x.

Given, 10% of x = ₹4000

$\Rightarrow \frac{10}{100} \times x = 4000$

$\Rightarrow x = \frac{4000 \times 100}{10}$

$\Rightarrow x = 40000$

Hence, Meeta's salary is ₹ 40000.

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

Solution:

Given,

Number of matches played by cricket team = 20

Percentage of matches won by team = 25%

Hence, total matches won by them = 25% of 20

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

$= 5$

Hence, they won 5 matches.

Exercise 8.3

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

(a) Gardening shears bought for ₹250 and sold for ₹325.

(b) A refrigerator bought for ₹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.

Solution:

(a) Cost price for Gardening shears is ₹250.

Selling price for Gardening shears is ₹325.

Since, SP > CP

Thus, there is a profit.

Profit = $SP - CP$

⇒Profit= ₹325 − ₹250

⇒Profit= ₹75

Also, we know that, Profit % = $\frac{\text{Profit}}{\text{CP}} \times 100\%$

⇒Profit % = $\frac{75}{250} \times 100\%$

⇒profit % = 30%

Hence, profit = ₹75 and Profit % = 30%.

(b) Cost price for refrigerator is ₹12000.

Selling price for refrigerator is ₹13500.

Since, $SP > CP$

Thus, there is a profit.

Profit = $SP - CP$

⇒Profit= ₹13500 − ₹12000

⇒Profit= ₹1500

Also, we know that, Profit % = $\frac{\text{Profit}}{\text{CP}} \times 100$

⇒Profit % = $\frac{1500}{12000} \times 100\%$

$\Rightarrow$profit % = 12.5%

Hence, profit = ₹1500 and Profit % = 12.5%.

(c) Cost price for cupboard is ₹2500.

Selling price for cupboard is ₹3000.

Since, $SP > CP$

Thus, there is a profit.

Profit = $SP - CP$

$\Rightarrow$Profit= ₹3000 − ₹2500

$\Rightarrow$Profit= ₹500

Also, we know that, Profit % = $\frac{\text{Profit}}{\text{CP}} \times 100$

$\Rightarrow$Profit % = $\frac{500}{2500} \times 100$

$\Rightarrow$profit % = 20%

Hence, profit = ₹500 and Profit% = 20%.

(d) Cost price for skirt is ₹250.

Selling price for skirt is ₹150.

Since, $CP > SP$

Thus, there is a loss.

Loss = $CP - SP$

$\Rightarrow$Loss= ₹250 − ₹150

$\Rightarrow$Loss= ₹100

Also, we know that, Loss % = $\frac{\text{Loss}}{\text{CP}} \times 100$

$\Rightarrow$Loss % = $\frac{100}{250} \times 100$

$\Rightarrow$Loss % = 40%

Hence, Loss= ₹100 and Loss% = 40%.

2. Convert each part of the ratio to percentage:

(a) 3 : 1

(b) 2 : 3 : 5

(c) 1 : 4

(d) 1 : 2 : 5

Solution:

(a) Given ratio is 3 : 1

Total part is $3 + 1 = 4$.

Therefore, the first part of ratio to percentage $= \frac{3}{4} \times 100\% = 75\%$

The second part of ratio to percentage $= \frac{1}{4} \times 100\% = 25\%$

(b) Given ration is 2 : 3 : 5

Total part is $2 + 3 + 5 = 10$.

Therefore, the first part of ratio to percentage $= \frac{2}{10} \times 100\% = 20\%$

The second part of ratio to percentage $= \frac{3}{10} \times 100\% = 30\%$

The third part of ratio to percentage $= \frac{5}{10} \times 100\% = 50\%$

(c) Given ration is 1 : 4

Total part is $1 + 4 = 5$.

Therefore, the first part of ratio to percentage $= \frac{1}{5} \times 100\% = 20\%$

The second part of ratio to percentage $= \frac{4}{5} \times 100\% = 80\%$

(d) Given ration is 1 : 2 : 5

Total part is $1 + 2 + 5 = 8$.

Therefore, the first part of ratio to percentage $= \frac{1}{8} \times 100\% = 12.5\%$

The second part of ratio to percentage $= \frac{2}{8} \times 100\% = 25\%$

The third part of ratio to percentage $= \frac{5}{8} \times 100\% = 62.5\%$

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

Solution:

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

Hence, original population = 25,000

Final population = 24,500

Decrease in population = original population − final population = 25,000 − 24,500 = 500

Percentage decrease= $\frac{\text{Decrease in population}}{\text{original population}} \times 100\%$

$= \frac{500}{25000} \times 100\%$

$= 2\%$

Hence, the percentage decrease in population of the city is 2%.

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

Solution:

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

Initial price = ₹3,50,000

Final price = ₹3,70,000

Increase in price=Final price−Initial price= ₹ 3,70,000 – ₹ 3,50,000 = ₹ 20,000.

Therefore, percentage increase in price = $\frac{Increase\ in\ price}{Initial\ price} \times 100\%$

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

$= 5\frac{5}{7}\%$

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

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?

Solution:

Given, the cost price of T.V. = ₹10,000

Profit percent = 20%

We know that, Profit% = $\frac{profit}{CP} \times 100\%$

⇒Profit= $\frac{\text{profit\%} \times CP}{100}$

⇒Profit= $\frac{20 \times 10000}{100}$

⇒Profit= ₹2000

Since, Selling price = ((C) P. + Profit

$\Rightarrow$ SP = ₹10,000 + ₹ 2,000 = ₹ 12,000

Hence, he gets ₹ 12000 on selling his T.V.

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

Solution:

Given, selling price of washing machine = ₹ 13,500

Loss percent = 20%

Let the cost price of washing machine be ₹ x

We know that, Loss% = $\frac{Loss}{CP} \times 100$

$\Rightarrow$Loss = $\frac{Loss\% \times CP}{100}$

$\Rightarrow$Loss = $\frac{20 \times x}{100}$

Since, $SP = CP$ – Loss

$$\Rightarrow 13500 = x - \frac{20 \times x}{100}$$

$$\Rightarrow 13500 = x - \frac{1}{5}x$$

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

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

$$\Rightarrow x = 16875$$

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

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?

Solution:

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

Therefore, 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 stick be $x\ g$.

$\Rightarrow 12\%$ of $x = 3$

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

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

Hence, the weight of chalk stick is 25 g.

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

Solution:

Given, CP of book is ₹275.

Loss% = 15%

We know that, Loss% $= \frac{Loss}{CP} \times 100$

$\Rightarrow$ Loss $= \frac{Loss\% \times CP}{100}$

$\Rightarrow$Loss$= \frac{15 \times 275}{100}$

$\Rightarrow$Loss= ₹41.25

Therefore, $S.P. = C.P.$ – Loss

$\Rightarrow$ S.P. = ₹275 − ₹41.25

$\Rightarrow$ S.P. = ₹ 233.75

Thus, she sells the book for ₹ 233.75.

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% $p.a.$

Solution:

(a) Given, P = ₹1200

$T = 3$ years

$R = 12\%\ p.a.$

We know that, S.I $= \frac{P \times R \times T}{100}$

$$\Rightarrow \text{S.I.} = \frac{1200 \times 12 \times 3}{100}$$

$$\Rightarrow \text{S.I.} = ₹432$$

Also, amount = principal + S.I.

$\Rightarrow$Amount= ₹1200 + ₹432

$\Rightarrow$Amount= ₹1632

Hence, amount to be paid at the end of 3 years is ₹1632.

(b) Given, $P = ₹7500$

$T = 3$ years

$R = 5\%\ p.a.$

We know that, $\text{S.I} = \frac{\text{P}\times\text{R}\times\text{T}}{100}$

$$\Rightarrow \text{S.I.} = \frac{7500 \times 5 \times 3}{100}$$

$$\Rightarrow \text{S.I.} = ₹1125$$

Also, amount = principal + S.I.

$\Rightarrow$Amount= ₹7500 + ₹1125

$\Rightarrow$Amount= ₹8,625

Hence, amount to be paid at the end of 3 years is ₹8,625.

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

Solution:

Given, $P = ₹56000$

$T = 2$ years

$S.I. = ₹280$

Let rate be $r\%\ p.a.$

We know that, $\text{S.I} = \frac{\text{P}\times\text{R}\times\text{T}}{100}$

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

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

$\Rightarrow \text{r} = 0.25\%$ p. ((a)

Hence, rate = 0.25% per annum.

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

Solution:

Given, $R = 9\%\ p.a.$

$T = 1$ year

$S.I. =$ ₹45

Let the sum she has borrowed be ₹x.

We know that, $S.I = \frac{P \times R \times T}{100}$

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

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

$$\Rightarrow x = ₹500$$

Hence, she has borrowed ₹500.

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