# 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 $m$ = 900$cm$

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

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

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

$\Rightarrow x = 20$ minutes

Hence, the whole quantity is 20 minutes.

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

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

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

$\Rightarrow x = 500$ 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 $= SP - CP$

$\Rightarrow$Profit$=$ ₹325 $-$ ₹250

$\Rightarrow$Profit$=$ ₹75

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

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

$\Rightarrow$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 $= SP - CP$

$\Rightarrow$Profit$=$ ₹13500 $-$ ₹12000

$\Rightarrow$Profit$=$ ₹1500

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

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

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

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

$$\Rightarrow x = ₹500$$

Hence, she has borrowed ₹$500$.

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