

8**COMPARING QUANTITIES****Exercise 8.1**

Q.1. Find the ratio of :

(a) Rs 5 to 50 paise

(b) 15 kg to 210 gm

(c) 9 m to 27 cm

(d) 30 days to 36 hours

Ans. (a) Ratio between Rs 5 to 50 paise

Rs 1 = 100 paise

\therefore Rs 5 = 500 paise

\Rightarrow Ratio between 500 paise to 50 paise

\Rightarrow 500 : 50 = 10 : 1

(b) Ratio between 15 kg to 210 gm

1 kg = 1000 gm, then 15 kg = 15000 gm.

\Rightarrow Ratio between 15000 gm to 210 gm

= 15000 : 210

= 500 : 7

(c) Ratio between 9 m to 27 cm.

1 m = 100 cm, then 9 m = 900 cm

\Rightarrow Ratio between 900 cm to 27cm

= 900 : 27

= 100 : 3

(d) Ratio between 30 days to 36 hours

1 day = 24 hours, then 30 days = 30×24 hours

= 720 hours.

\Rightarrow Ratio between 720 hrs. to 36 hrs.

$$= 720 : 36, = 20 : 1$$

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

Ans. For 6 students no. of computer = 3

$$\text{So, for 1 student no. of computer} = \frac{3}{6} = \frac{1}{2}$$

$$\text{For 24 students no. of computer} = \frac{1}{2} \times 24 = 12$$

Hence, 12 computers will be needed for 24 students.

Q.3. Population of Rajasthan = 570 lakh and population of UP = 1660 lakhs, and area of Rajasthan = 3 lakh km² and area of UP = 2 lakh km².

- (i) How many people are there per km² in both these States?**
- (ii) Which State is less populated?**

Ans. (i) Rajasthan :

Number of people per square km (k)²

$$= \frac{\text{Total Population of Rajasthan}}{\text{Total area of Rajasthan}}$$

$$= \frac{570 \text{ lakh}}{3 \text{ lakh sq. km}} = 190 \text{ people}$$

U.P

Number of people per square km (k)²

$$= \frac{\text{Total Population of UP}}{\text{Total area of UP}}$$

$$= \frac{1660 \text{ lakh}}{2 \text{ lakh km}} = 830 \text{ people}$$

- (ii) Population of U.P per square km is greater than that of Rajasthan.

Hence, Rajasthan is less populated.

Exercise 8.2

Q.1. Convert the given fractional numbers to per cents.

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

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

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

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

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

Divide and multiply by 100 we have

$$\begin{aligned}\frac{1 \times 100}{8 \times 100} &= \frac{100}{800} = \frac{25}{200}, = \frac{25}{2} \% \\ &= 12\frac{1}{2} \% = 12.5 \%\end{aligned}$$

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

Divide and multiply by 100 we have,

$$\begin{aligned}\frac{5 \times 100}{4 \times 100} &= \frac{500}{4 \times 100} = \frac{250}{200} \\ &= \frac{125}{100} = 125\%\end{aligned}$$

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

Divide and multiply by 100 we have,

$$\frac{3 \times 100}{40 \times 100} = \frac{15}{200} = 7\frac{1}{2} \% = 7.5 \%$$

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

Divide and multiply by 100 we have,

$$\frac{2 \times 100}{7 \times 100} = \frac{200}{700} = 28\frac{4}{7}\%$$

Q.2. Convert the given decimal fractions to per cents.

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

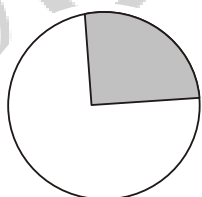
Ans. (a) $0.65 = \frac{65}{100} = 65\%$

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

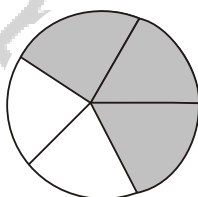
(c) $0.02 = \frac{2}{100} \times 100\% = 2\%$

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

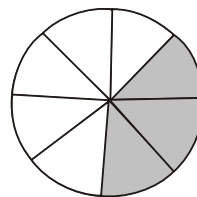
Q.3. Estimate what part of the figures is coloured and hence find the per cent which is coloured.



(i)



(ii)



(iii)

Ans. (i) Part of the figure coloured = $\frac{1}{4}$

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

(ii) The coloured part in the figure = $\frac{3}{5}$

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

$$\text{(iii) The coloured part in the figure} = \frac{3}{8}$$

$$\text{Percentage of coloured part} = \frac{3}{8} \times 100\%$$

$$= \frac{75}{2} = 37\frac{1}{2}\%$$

$$= 37.5\%$$

Q.4. Find :

(a) 15 % of 250

(b) 1% of 1 hour

(c) 20% of Rs 2500

(d) 75% of 1 kg

$$\text{Ans. (a) } 15\% \text{ of } 250 = \frac{15}{100} \times 250 = \frac{75}{2} = 37\frac{1}{2} = 37.50$$

(b) 1 % of 1 hour

$$= 1\% \text{ of } 60 \text{ min.} = \frac{1}{100} \times 60 = \frac{3}{5} \text{ minutes}$$

$$\text{or } \frac{3}{5} \times 60 \text{ sec.} = 36 \text{ seconds [Since 1 min. = 60 seconds]}$$

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

$$= \text{Rs } 500$$

$$\text{(d) } 75\% \text{ of } 1 \text{ kg.} = \frac{75}{100} \times 1000 \text{ gm}$$

$$= 750 \text{ gm} \quad [1 \text{ kg} = 1000 \text{ gm}]$$

Q.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 litres.

Ans. Let the whole quantity be x .

(a) $5\% \text{ of } x = 600$

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

$$\Rightarrow \frac{x}{20} = \frac{600}{1}$$

$$\Rightarrow x = 20 \times 600$$

$$\therefore x = 12000$$

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

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

$$\Rightarrow 12x = 1080 \times 100$$

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

$$= \text{Rs } 9,000$$

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

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

$$\Rightarrow 2x = 5 \times 500$$

$$\Rightarrow x = \frac{5 \times 500}{2}$$

$$\therefore x = 1250 \text{ km.}$$

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

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

$$\Rightarrow 7x = 14 \times 10$$

$$\Rightarrow x = \frac{14 \times 10}{7}$$

$$\therefore x = 20 \text{ minutes.}$$

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

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

$$\Rightarrow 2x = 40 \times 25$$

$$\Rightarrow x = \frac{40 \times 25}{2}$$

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

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

(a) 25% (b) 150% (c) 20% (d) 5%

Ans. (a) $25\% = \frac{25}{100} = \frac{5}{20} = \frac{1}{4} = 0.25$

(b) $150\% = \frac{150}{100} = \frac{15}{10} = \frac{3}{2} = 1.5$

(c) $20\% = \frac{20}{100} = \frac{2}{10} = \frac{1}{5} = 0.2$

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

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

Ans. Percentage of females = 30%

Percentage of males = 40%

$$\begin{aligned}\therefore \text{Total percentage of males and females} &= 30\% + 40\% \\ &= 70\%\end{aligned}$$

$$\begin{aligned}\therefore \text{Percentage of children} &= 100\% - (\text{total percentage of} \\ &\quad \text{males and females}) \\ &= 100\% - 70\% \\ &= 30\%\end{aligned}$$

Hence, percentage of children is 30%.

Q.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?

Ans. Percentage of voters who voted = 60%

$$\begin{aligned}\text{Percentage of voters who did not vote} &= 100\% - 60\% \\ &= 40\%\end{aligned}$$

$$\therefore \text{Total voters} = 15,000$$

So, numbers of voters who did not vote

$$\begin{aligned}&= 40\% \text{ of } 15,000 \\ &= \frac{40}{100} \times 15,000 \\ &= 6000 \text{ voters}\end{aligned}$$

Hence, 6000 voters did not vote.

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

Ans. Let Meeta's salary be Rs. x .

As per condition,

$$\text{Meeta saves } 10\% \text{ of } x = 400,$$

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

$$\therefore x = 400 \times 10 = \text{Rs } 4000$$

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

Ans. No. of total match = 20

Percentage of match won = 25%

\therefore Total number of matches won = 25% of 20

$$= 20 \times \frac{25}{100} = 5$$

Hence, they won 5 matches.

Exercise 8.3

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

Ans. (a) C P = Rs. 250

S P = Rs. 325

Here, S P > C P

So, profit = S P – C P

$$= \text{Rs } 325 - \text{Rs } 250 = \text{Rs } 75$$

$$\begin{aligned}\therefore \text{Profit \%} &= \frac{\text{Profit}}{\text{C P}} \times 100\%, \\ &= \frac{75}{250} \times 100\%\end{aligned}$$

$$\text{Hence, profit \%} = 30\%$$

$$(b) \quad \text{C P} = \text{Rs } 12,000, \quad \text{S P} = \text{Rs } 13,500$$

$$\text{Here, S P} > \text{C P}$$

$$\text{So, profit} = \text{Rs } 13,500 - \text{Rs } 12,000 = \text{Rs } 1,500$$

$$\text{Profit \%} = \frac{1500}{12000} \times 100\% = 12\frac{1}{2}\%$$

$$\text{Hence, profit \%} = 12\frac{1}{2}\% = 12.5\%$$

$$(c) \quad \text{C P} = \text{Rs } 2500, \quad \text{S P} = \text{Rs } 3000$$

$$\text{Here, S P} > \text{C P}$$

$$\text{So, Profit} = \text{Rs } 3000 - \text{Rs } 2500 = \text{Rs } 500$$

$$\therefore \text{Profit \%} = \frac{500}{2500} \times 100\% = 20\%$$

$$\text{Hence, profit \%} = 20\%$$

$$(d) \quad \text{C P} = \text{Rs } 250, \quad \text{S P} = \text{Rs } 150$$

$$\text{Here, C P} > \text{S P}$$

$$\text{So, loss} = \text{C P} - \text{S P}$$

$$= \text{Rs } 250 - \text{Rs } 150 = \text{Rs } 100$$

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

$$\text{Hence, loss \%} = 40\%$$

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

(a) 3 : 1 (b) 2 : 3 : 5 (c) 1 : 4 (d) 1 : 2 : 5

Ans. (a) Total parts of the ratio = $3 + 1 = 4$

$$\therefore \frac{3}{4} = \frac{3}{4} \times \frac{100}{100} \quad (\text{Divide and Multiply by 100})$$

$$\text{or} \quad = \frac{75}{100} = 75\%$$

\therefore Each parts of the ratio are 75% and 25%.

(b) Total parts of the ratio = $2 + 3 + 5 = 10$

$$\therefore \frac{2}{10} = \frac{2}{10} \times \frac{100}{100} \quad (\text{Divide and Multiply by 100})$$

$$= \frac{20}{100} = 20\%$$

$$\therefore \frac{3}{10} = \frac{3}{10} \times 100\% \quad \text{Divide and multiply by 100}$$

$$= 30\%$$

$$\therefore \frac{5}{10} = \frac{5}{10} \times \frac{100}{100} = 50\%$$

\therefore Each parts of the ratio are 20%, 30% and 50%.

Divide and multiply by 100

(c) Total parts of the ratio = $1 + 4 = 5$

$$\therefore \frac{1}{5} = \frac{1}{5} \times \frac{100}{100} = 20\% \quad (\text{Divide and multiply by 100})$$

$$\therefore \frac{4}{5} = \frac{4}{5} \times \frac{100}{100} \quad (\text{Divide and multiply by 100})$$

$$= 80\%$$

\therefore Each parts of the ratio are 20% and 80%

(d) Total parts of the ratio = $1 + 2 + 5 = 8$

$$\therefore \frac{1}{8} = \frac{1}{8} \times \frac{100}{100} \quad \text{Divide and multiply by 100}$$

$$= \frac{1}{2}\% = 12\frac{1}{2}\% = 12.5\%$$

$$\therefore \frac{2}{8} = \frac{2}{8} \times \frac{100}{100} \quad \text{Divide and multiply by 100}$$

$$= 25\%$$

$$\therefore \frac{5}{8} = \frac{5}{8} \times \frac{100}{100} \quad \text{Divide and multiply by 100}$$

$$= 62\frac{1}{2}\% = 62.5\%$$

\therefore Each parts of the ratio are 12.5%, 25% and 62.5%.

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

$$\begin{aligned} \text{Ans. Percentage decrease} &= \frac{\text{Decreased in population}}{\text{Original population}} \times 100\% \\ &= \frac{25000 - 24500}{25000} \times 100\% \\ &= \frac{500}{25000} \times 100\% = 2\% \end{aligned}$$

Hence, 2 percent population is decreased.

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

$$\text{Ans. Per cent age of price increase} = \frac{\text{Increased in price}}{\text{Original price}} \times 100\%$$

$$= \frac{3,70,000 - 3,50,000}{3,50,000} \times 100\%$$

$$= \frac{20,000}{3,50,000} \times 100\% = \frac{40}{7}\%$$

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

Q.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?

Ans. C P = Rs 10,000, S P = ? Profit = 20%

$$S P = \left(\frac{100 + \text{Profit \%}}{100} \right) \times C P$$

$$= \left(\frac{100 + 20}{100} \right) \times 10,000 = \frac{120}{100} \times 10,000$$

$$\therefore S P = \text{Rs } 12,000$$

Hence, I get Rs 12,000 for it.

Q.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?

Ans. S P = Rs 13,500, Loss = 20%, C P = ?

$$S P = \left(\frac{100 - \text{Loss \%}}{100} \right) \times C P$$

$$\Rightarrow 13,500 = \left(\frac{100 - 20}{100} \right) \times C P$$

$$\Rightarrow 13,500 = \frac{80}{100} \times C P$$

$$\Rightarrow 8 C P = 13500 \times 10$$

$$\text{So, } C P = \frac{135000}{8} = \text{Rs } 16,875$$

Hence, the price of washing machine at which she bought is Rs 16,875.

Q.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 3g, what is the weight of the chalk stick?

Ans. (i) Calcium : Carbon : Oxygen = 10 : 3 : 12

$$\text{Total parts of ratio} = 10 + 3 + 12 = 25$$

$$\begin{aligned} \text{Percentage of carbon in chalk} &= \frac{3}{25} \times 100\% \\ &= 12\% \end{aligned}$$

Hence, percentage of carbon in chalk is 12%.

(ii) Let total weight of chalk stick = x

According to question, 12% of $x = 3$ gm

$$\text{or, } \frac{12}{100} \times x = 3 \text{ gm}$$

$$\begin{aligned} \Rightarrow x &= \frac{3 \times 100}{12} \\ &= 25 \text{ gm} \end{aligned}$$

Hence, total weight of chalk stick = 25 gm

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

Ans. (i) $C P = \text{Rs } 275$, $S P = ?$ Loss = 15%

$$S P = \left(\frac{100 - \text{Loss \%}}{100} \right) \times C P, \text{ Where } C P = \text{Cost Price,}$$

$S P = \text{Selling Price}$

$$= \left(\frac{100 - 15}{100} \right) \times 275 = \frac{85}{100} \times 275 = \text{Rs } 233.75$$

Hence, Amina sell is book for Rs 233.75.

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

(a) Principal = Rs 1200 at 12% p.a.

(b) Principal = Rs 7500 at 5% p.a.

Ans. (a) We know, $S.I. = \frac{PRT}{100} = \frac{1200 \times 12 \times 3}{100} = \text{Rs } 432$

$$\Rightarrow A = P + I = 1200 + 432 = \text{Rs } 1,632$$

(b) We know, $S I = \frac{P \times R \times T}{100}$

$$= \frac{7500 \times 5 \times 3}{100} = \text{Rs } 1125$$

$$\Rightarrow A = P + I = 7500 + 1125 = \text{Rs } 8625$$

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

Ans. (a) $P = \text{Rs } 56000, \quad S I = \text{Rs } 280,$

$$T = 2 \text{ years, } R = ?$$

$$S I = \frac{PRT}{100},$$

Where, $P = \text{Principal, } R = \text{Rate,}$

$T = \text{Time, } S I = \text{Simple interest}$

$$\text{So, } R = \frac{S I \times 100}{P T} = \frac{280 \times 100}{56000 \times 2} = 0.25\%$$

Hence, rate of interest is 0.25%.

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

Ans. (a) $S I = \text{Rs } 45$, $R = 9\%$, $T = 1 \text{ years}$, $P = ?$

$$P = \frac{S I \times 100}{R \times T} = \frac{45 \times 100}{9 \times 1}, \text{ Where, } P = \text{Principal,}$$

$T = \text{Time, } SI = \text{Interest,}$

$R = \text{Rate}$

$\therefore \text{Sum, } P = \text{Rs } 500$

Hence, Meena has borrowed Rs 500.