CLASS-7 **SUB-MATHS**

CHAPTER - 8

Comparing Quantities

Ex.8.1

Question 1. Find the ratio of:

(a) Rs. 5 to 50 paise

(b) 15 kg to 210 g

(c) 9 m to 27 cm

(d) 30 days to 36 hours

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

(a) Rs. 5 to 50 paise

$\Rightarrow$ 5 x 100 paise to 50 paise [$\because$ Rs. 1 = 100 paise]

$\Rightarrow$ 500 paise to 50 paise

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

(b) 15 kg to 210 g

$\Rightarrow$ 15 x 1000 g to 210 g [$\because$ 1 kg = 1000 g]

$\Rightarrow$ 15000 g to 210 g

Thus, the ratio is = $\frac{10}{1}\ \frac{15000}{210}$ = 500 : 7

(c) 9 m to 27 cm

$\Rightarrow$ 9 x 100 cm to 27 cm [$\because$ 1 m = 100 cm]

$\Rightarrow$ 900 cm to 27 cm

Thus, the ratio is = $\frac{500}{7}\ \frac{900}{27}$ = 100 : 3

(d) 30 days to 36 hours

$\Rightarrow$ 30 x 24 hours to 36 hours [∵ 1 day = 24 hours]

$\Rightarrow$ 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: 6 students needed = 3 computers

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

24 students needs = $\frac{3}{6}$ times 24 = 12 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^2 and area of U.P. = 2 lakh km^2.

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

(ii) Which state is less populated?

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

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

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

= 830 people per km^2

(ii) Rajasthan is less populated.

Ex. 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: (a) $\frac{1}{8} = \frac{1}{8} \times 100\% = \frac{25}{2}\%$ = 12.5%

(b) $\frac{5}{4} = \frac{5}{4} \times 100\% =$ 5 x 25% = 125%

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

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

Question 2. Convert the given decimal fractions to percents:

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

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

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

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

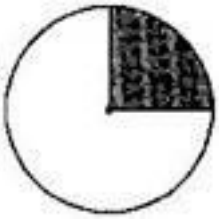
(d) 12.35 = $\frac{1235}{100} \times 100\%$ = 1235%

Question 3. Estimate what part of the figures is coloured and hence find the percent which is coloured:

(i) (ii) (iii)

Answer: (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 Rs. 2500

(d) 75% of 1 kg

Answer: (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% of Rs. 2500 $= \frac{20}{100} \times 2500 = 20 \times 25 = \text{Rs. } 500$

(d) 75% of 1 kg = 75% of 1000 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 Rs. 1080

(c) 40% of it is 500 km

(d) 70% of it is 14 minutes

(e) 8% of it is 40 liters

Answer: Let the whole quantity be x in given questions:

(a) 5% of x x = 600

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

$\Rightarrow x = \frac{600 \times 100}{5}$ = 12,000

(b) 12% of x = Rs. 1080

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

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

(c) 40% of x = 500 km

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

$\Rightarrow x = \frac{500 \times 100}{40}$ = 1,250 km

(d) 70% of x = 14 minutes

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

$\Rightarrow x = \frac{14 \times 100}{70}$ = 20 minutes

(e) 8% of x = 40 liters

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

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

Question 6. Convert given percents to decimal fractions and also to fractions in simplest forms:

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

Answer:

S.No.	Percents	Fractions	Simplest form	Decimal form
(a) (b)	25%			0.25
(c)	150%			1.5
(d)	20%			0.2

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

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

= 6,000 Hence, 6,000 candidates did not vote.

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

Answer: Let Meera's salary be Rs. x.

		$\frac{25}{100}$
		$\frac{150}{100}$
		$\frac{20}{100}$
		$\frac{5}{100}$

Now, 10% of salary = Rs. 400

$\Rightarrow$ 10% of x = Rs. 400

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

$\Rightarrow x = \frac{400 \times 100}{25}$

$\Rightarrow x = \frac{}{10}$ = 4,000

Hence, Meera's salary is Rs. 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: Number of matches played by cricket team = 20

Percentage of won matches = 25%

Total matches won by them = 25% of 20 = $\frac{10}{100} \times 20$

= 5 Hence, they won 5 matches.

Ex. 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 Rs. 250 and sold for Rs. 325.

(b) A refrigerator bought for Rs. 12,000 and sold for Rs. 13,500.

(c) A cupboard bought for Rs. 2,500 and sold for Rs. 3,000.

(d) A skirt bought for Rs. 250 and sold for Rs. 150.

Answer: (a) Cost price of gardening shears = Rs. 250

Selling price of gardening shears = Rs. 325

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

$\therefore$ Profit = S.P. – C.P. = 325 – 250 = Rs. 75

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

Therefore,

Profit = Rs. 75 and Profit% = 30%

(b) Cost price of refrigerator = Rs. 12,000

Selling price of refrigerator = Rs. 13,500

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

$\therefore$ Profit = S.P. – C.P. = 13500 – 12000 = Rs. 1,500

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

Therefore, Profit = Rs. 1,500 and Profit% = 12.5%

(c) Cost price of cupboard = Rs. 2,500

Selling price of cupboard = Rs. 3,000

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

$\therefore$ Profit = S.P. – C.P. = 3,000 – 2,500 = Rs. 500

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

Therefore, Profit = Rs. 500 and Profit% = 20%

(b) Cost price of skirt = Rs. 250

Selling price of skirt = Rs. 150

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

$\therefore$ Loss = C.P. – S.P. = 250 – 150 = Rs. 100

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

Therefore, Profit = Rs. 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: (a) 3 : 1

Total part = 3 + 1 = 4

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

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

$\Rightarrow$ Percentage of parts = 75%:25%

(b) 2 : 3 : 5

Total part = 2 + 3 + 5 = 10

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

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

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

(c) 1 : 4

Total part = 1 + 4 = 5

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

= $\frac{1}{5}$ $\frac{4}{5}$

$\Rightarrow$ Percentage of parts $= \times 100 : \quad \times 100$

$\Rightarrow$ 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: The population of a city decreased from 25,000 to 24,500.

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

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

Hence, the percentage decreased is 2%.

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

Answer: Increased in price of a car from Rs. 3,50,000 to Rs. 3,70,000. Amount change = Rs. 3,70,000 – Rs. 3,50,000 = Rs. 20,000.

Therefore, Increased percentage $= \frac{\text{Amount of change}}{\text{Original amount}} \times 100$

$= \frac{20000}{350000} \times 100 = 5\frac{5}{7}\%$

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

Question 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?

Answer: The cost price of T.V. = Rs. 10,000 Profit percent = 20%

Now, Profit = Profit% of C.P.

$=\frac{20}{100} \times 10000$ = Rs. 2,000

Selling price = C.P. + Profit

= 10,000 + 2,000 = Rs. 12,000

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

Question 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?

Answer: Selling price of washing machine = Rs. 13,500
Loss percent = 20%

Let the cost price of washing machine be Rs. x.

Since, Loss = Loss% of C.P.

$\Rightarrow$ Loss = 20% of Rs. x $=\frac{20}{100} \times x = \frac{x}{5}$

Therefore, S.P. = C.P. – Loss

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

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

Hence, the cost price of washing machine is Rs. 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: (i) Given ratio = 10 : 3 : 12

Total part = 10 + 3 + 12 = 25

Part of Carbon = 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

$\Rightarrow \frac{P \times R \times T}{100} \times x = 3$ $\frac{7500 \times 5 \times 3}{100}$

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

Hence, the weight of chalk stick is 25 g.

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

Answer: The cost price of a book = Rs.

275 Loss percent = 15%

Loss = Loss% of C.P. = 15% of Rs. 275 = $\frac{15}{100} \times 275$ = Rs.

41.25 Therefore, S.P. = C.P. – Loss = 275 – 41.25 = Rs. 233.75

Hence, Amina sells a book for Rs. 233.75.

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

(a) Principal = Rs. 1,200 at 12% p.a.

(b) Principal = Rs. 7,500 at 5% p.a.

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

Simple Interest = $\frac{12}{100}$ = = Rs. 432

Now, Amount = Principal + Simple Interest = 1200 + 432 = Rs. 1,632

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

$\frac{P \times R \times T}{100}$ $\frac{1200 \times 12 \times 3}{100}$

Simple Interest = = = Rs. 1,125

Now, Amount = Principal + Simple Interest = 7,500 + 1,125 = Rs. 8,625

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

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

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

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

$\Rightarrow R = \frac{280 \times 100}{56000 \times 2} = 0.25\%$

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

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

Answer: Simple Interest = Rs. 45, Rate (R) = 9% p.a., Time (T) = 1 year

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

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

$\Rightarrow P = \frac{45 \times 100}{9 \times 1} = Rs. 500$

Hence, she borrowed Rs. 500.