NCERT Solutions for Class 8 Maths Chapter 7 - Comparing Quantities

Ex 7.1 Question 1.

Find the ratio of the following:

(a) Speed of a cycle 15 km per hour to the speed of scooter 30 km per hour.

(b) 5 m to 10 km

(c) 50 paise to Rs. 5

Answer.

(a) Speed of cycle $= 15 \text{ km/hr}$

Speed of scooter $= 30 \text{ km/hr}$

Hence ratio of speed of cycle to that of scooter $= 15 : 30 = \frac{15}{30} = \frac{1}{2} = 1 : 2$

(b) $\because 1 \text{ km} = 1000 \text{ m}$

$\therefore 10 \text{ km} = 10 \times 1000 = 10000 \text{ m}$

$\therefore$ Ratio $= \frac{5 \text{ m}}{10000 \text{ m}} = \frac{1}{2000} = 1 : 2000$

(c) $\because$ Rs $1 = 100$ paise

$\therefore$ Rs $5 = 5 \times 100 = 500$ paise

Hence Ratio $= \frac{50 \text{ paise}}{500 \text{ paise}} = \frac{1}{10} = 1 : 10$

Ex 7.1 Question 2.

Convert the following ratios to percentages:

(a) $3 : 4$

(b) $2 : 3$

Answer.

(a) Percentage of $3 : 4 = \frac{3}{4} \times 100\% = 75\%$

(b) Percentage of $2 : 3 = \frac{2}{3} \times 100\% = 66\frac{2}{3}\%$

Ex 7.1 Question 3.

72% of 25 students are good in mathematics. How many are not good in mathematics?

Answer.

Total number of students $= 25$

Number of good students in mathematics $= 72\%$ of $25 = \frac{72}{100} \times 25 = 18$

Number of students not good in mathematics $= 25 - 18 = 7$

Hence percentage of students not good in mathematics $= \frac{7}{25} \times 100 = 28\%$

Ex 7.1 Question 4.

A football team won 10 matches out of the total number of matches they played. If their win percentage was 40 , then how many matches did they play in all?

Answer.

Let total number of matches be x
According to question,

40% of total matches $= 10$
$\Rightarrow 40\%$ of $x = 10$
$\Rightarrow \dfrac{40}{100} \times x = 10$
$\Rightarrow x = \dfrac{10 \times 100}{40} = 25$

Hence total number of matches are 25 .

Ex 7.1 Question 5.

If Chameli had Rs. 600 left after spending 75% of her money, how much money did

she have in the beginning?

Answer.

Total percentage of money she didn't spent $= 100\% - 75\% = 25\%$
According to question,
$\Rightarrow 25\% = 600$
$\Rightarrow 1\% = 600/25$
$\Rightarrow 100\% = \dfrac{600}{25} \times 100$

Hence the money in the beginning was Rs 2,400.

Ex 7.1 Question 6.

If 60% people in a city like cricket, 30% like football and the remaining like other games, then what percent of the people like other games? If the total number of people are 50 lakh, find the exact number who like each type of game.

Answer.

Number of people who like cricket $= 60\%$
Number of people who like football $= 30\%$
Number of people who like other games $= 100\% - (60\% + 30\%) = 10\%$
Now Number of people who like cricket $= 60\%$ of $50,00,000$

$= \frac{60}{100} \times 50,00,000 = 30,00,000$

And Number of people who like football
$= 30\%$ of $50,00,000$
$= \dfrac{30}{100} \times 50,00,000 = 15,00,000$
$\therefore$ Number of people who like other games $= 10\%$ of $50,00,000$
$= \dfrac{10}{100} \times 50,00,000 = 5,00,000$

Hence, number of people who like other games are 5 lakh.

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Ex 7.2 Question 1.

During a sale, a shop offered a discount of 10% on the marked prices of all the items. What would a customer have to pay for a pair of jeans marked at Rs.1450and two shirts marked at Rs. 850 each?

Answer.

Rate of discount on all items $= 10\%$

Marked Price of a pair of jeans = Rs. 1450 and Marked Price of a shirt = Rs. 850

Discount on a pair of jeans
$= \frac{\text{Rate} \times \text{M.P.}}{100} = \frac{10 \times 1450}{100} =$ Rs. 145

$\therefore$ S.P. of a pair of jeans $=$ Rs. $1450-$ Rs. $145 =$ Rs. 1305

Marked Price of two shirts $= 2 \times 850 =$ Rs. 1700

Discount on two shirts $= \frac{\text{Rate} \times \text{M.P.}}{100} = \frac{10 \times 1700}{100} =$ Rs. 170

$\therefore$ S.P. of two shirts $=$ Rs. $1700-$ Rs. $170 =$ Rs. 1530

Therefore the customer had to pay $= 1305 + 1530$

= Discount on a pair of jeans

$$= \frac{\text{Rate} \times \text{M.P.}}{100} = \frac{10 \times 1450}{100}$$

$$= \text{Rs. } 145$$

$\therefore$ S.P. of a pair of jeans

$$= \text{Rs. } 1450 - \text{Rs. } 145 = \text{Rs.2,835}$$

Thus, the customer will have to pay Rs.2,835

Ex 7.2 Question 2.

The price of a TV is Rs. 13,000 . The sales tax charged on it is at the rate of 12%. Find the amount that Vinod will have to pay if he buys it.

Answer.

C.P. = Rs. 13,000 and S.T. rate $= 12\%$

Let C.P. be Rs.100, then S.P. for purchaser

$= 100 + 12 =$ Rs. 112

$\because$ When C.P. is Rs. 100 , then S.P. $=$ Rs. 112

$\therefore$ When C.P. is Rs.1, then S.P. $= \frac{112}{100}$

$\therefore$ When C.P. is Rs. 13,000 , then S.P.

$= \frac{112}{100} \times 13000 =$ Rs. $14,560$

He will have to pay Rs. 14,560

Ex 7.2 Question 3.

Arun bought a pair of skates at a sale where the discount given was 20%. If the amount he pays is Rs.1,600, find the marked price.

Answer.

S.P. = Rs. 1,600 and Rate of discount = 20%

Let M.P. be Rs. 100 , then S.P. for customer = $100 - 20$ = Rs. 80
∵ When S.P. is Rs. 80 , then M.P. = Rs. 100
∴ When S.P. is Rs.1, then M.P. = $\frac{100}{80}$
∴ When S.P. is Rs. 1600 , then M.P.
= $\frac{100}{80} \times 1600 =$ Rs. $2,000$

Thus, the marked price was Rs. 2,000

Ex 7.2 Question 4.

I purchased a hair-dryer for Rs.5,400 including 8\% VAT. Find the price before VAT was added.

Answer.

C.P. = Rs.5,400 and Rate of VAT = 8%

Let C.P. without VAT is Rs. 100, then price including VAT = $100 + 8$ = Rs. 108
∵ When price including VAT is Rs. 108 , then original price = Rs. 100
∴ When price including VAT is Rs.1, then original price = $\frac{100}{108}$
∴ When price including VAT is Rs.5400, then original price = $\frac{100}{108} \times 5400$ = Rs. 5000
Thus, the price of Hair Dryer before the addition of VAT was Rs 5000

Ex 7.2 Question 5.

An article was purchased for Rs. 1239 including GST of 18%. Find the price of the

article before GST was added?

Answer.

Given,
$\text{GST} = 18\%$

Cost with GST included = Rs. 1239
Cost without GST = x Rs.
$x + (18/100 \times x) = 1239$
cost before GST+ GST = cost with GST
$x + (9x/50) = 1239$
$x = 1050$

Price before GST = 1050 rupees

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Ex 7.3 Question 1.

The population of a place increased to 54,000 in 2003 at a rate of 5% per annum.

(i) Find the population in 2001.

(ii) What would be its population in 2005 ?

Answer.

(i) Here, $A_{2003} =$ Rs. $54,000, R = 5\%, n = 2$ years

Population would be less in 2001 than 2003 in two years.

Here population is increasing.

$$\therefore A_{2003} = P_{201}\left(1 + \frac{R}{100}\right)^n$$

$$\Rightarrow 54000 = P_{2001}\left(1 + \frac{5}{100}\right)^2$$

$$\Rightarrow 54000 = P_{2001}\left(1 + \frac{1}{20}\right)^2$$

$$\Rightarrow 54000 = P_{2001}\left(\frac{21}{20}\right)^2$$

$$\Rightarrow 54000 = P_{2001} \times \frac{21}{20} \times \frac{21}{20}$$

$$\Rightarrow P_{2001} = \frac{54000 \times 20 \times 20}{21 \times 21}$$

$$= 48,979.5$$

$$\Rightarrow P_{2001} = 48,980 \text{ (approx.)}$$

(ii) According to question, population is increasing. Therefore population in 2005,
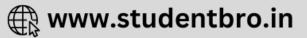
$$A_{2005} = P\left(1 + \frac{R}{100}\right)^n$$

$$= 54000\left(1 + \frac{5}{100}\right)^2$$

$$= 54000\left(1 + \frac{1}{20}\right)^2$$

$$= 54000\left(\frac{21}{20}\right)^2$$

$$= 54000 \times \frac{21}{20} \times \frac{21}{20}$$

$$= 59,535$$

Hence population in 2005 would be 59,535.

Ex 7.3 Question 2.

In a laboratory, the count of bacteria in a certain experiment was increasing at the rate of 2.5% per hour. Find the bacteria at the end of 2 hours if the count was initially $5,06,000$.

Answer.

Here, Principal $(P) = 5,06,000$, Rate of Interest $(R) = 2.5\%$, Time $(n) = 2$ hours

After 2 hours, number of bacteria,

$$\text{Amount (A) } P\left(1 + \frac{R}{100}\right)^n$$

$$= 506000\left(1 + \frac{2.5}{100}\right)^2$$

$$= 506000\left(1 + \frac{25}{1000}\right)^2$$

$$= 506000\left(1 + \frac{1}{40}\right)^2$$

$$= 506000\left(\frac{41}{40}\right)^2$$

$$= 506000 \times \frac{41}{40} \times \frac{41}{40}$$

$$= 5,31,616.25$$

Hence, number of bacteria after two hours are 531616 (approx.).

Ex 7.3 Question 3.

A scooter was bought at Rs. 42,000 . Its value depreciated at the rate of 8% per annum. Find its value after one year.

Answer.

Here, Principal $(P) = $ Rs. 42,000, Rate of Interest $(R) = 8\%$, Time $(n) = 1$ years

$$\text{Amount (A)} = P\left(1 - \frac{R}{100}\right)^{12}$$

$$= 42000\left(1 - \frac{8}{100}\right)^1$$

$$= 42000\left(1 + \frac{2}{25}\right)^1$$

$$= 42000\left(\frac{27}{25}\right)^1$$

$$= 42000 \times \frac{27}{25}$$

$$= \text{ Rs. } 38,640$$

Hence, the value of scooter after one year is Rs. 38,640.