Puna International School
Shree Swaminarayan Gurukul, Zundal

Grade – 8
MATHS
Specimen copy
Year 22-23

INDEX

Chapter no	Name	
8	Data Handling	September

Notes
Chapter – 8
Comparing Quantities

- **Ratio**: Comparing by division is called ratio. Quantities written in ratio have the same unit. Ratio has no unit. Equality of two ratios is called proportion.
- Product of extremes = Product of means
- **Percentage**: Percentage means for every hundred. The result of any division in which the divisor is 100 is a percentage. The divisor is denoted by a special symbol %, read as percent.

- **Profit and Loss**:

  Cost Price (CP): The amount for which an article is bought.

  Selling Price (SP): The amount for which an article is sold.

- Additional expenses made after buying an article are included in the cost price and are known as **overhead expenses**. These may include expenses like amount spent on repairs, labour charges, transportation, etc.

- **Discount** is a reduction given on marked price. Discount = Marked Price – Sale Price.

- Discount can be calculated when discount percentage is given. Discount = Discount % of Marked Price

- Additional expenses made after buying an article are included in the cost price and are known as **overhead expenses.** CP = Buying price + Overhead expenses

- Sales tax is charged on the sale of an item by the government and is added to the Bill Amount. Sales tax = Tax% of Bill Amount

- **Simple Interest**: If the principal remains the same for the entire loan period, then the interest paid is called simple interest. $SI = P \times R \times T / 100$

- Compound interest is the interest calculated on the previous year's amount $(A = P + I)$

  (i) Amount when interest is compounded annually

- $A = P (1+R/100)^n$. P is principal, R is rate of interest, n is time period

  (ii) Amount when interest is compounded half yearly

  $A = P (1 + R / 100)^{2n}$

  [R / 2 is ,half yearly rate and 2n = number of ′half−years′

Ex: 8.1

1(1). Find the ratio of the speed of a cycle 15 km per hour to the speed of scooter 30 km per hour.

Sol.

Speed of cycle = 15km/hr

Speed of scooter = 30km/hr

Hence ratio of speed of cycle to that of scooter = 15 : 30

= 15 / 30

= 1 / 2

= 1 : 2

1(2). Find the ratio of the 5 m to 10 km.

Sol.
∵
1km = 1000m

∴ 10 km = 10 ×× 1000 m = 10000 m

Ratio = 5 m : 10 km

= 5 m : 10000 m

= 5 : 10000

= 5 / 10000

= 1 / 20000

= 1 : 2000

1(3). Find the ratio of the 50 paise to ₹ 5.

Sol.
∵ ₹1 = 100 paise

₹. 5 = 5 ×× 100 = 500 paise

∴ Ratio of 50 paise to ₹ 5

= 50 paise : ₹ 5

= 50 paise : 500 paise

= 50 : 500

$$= 50 / 500$$

$$= 1 / 10$$
$$= 1 : 10$$

2(1). Convert 3 : 4 to percentage.

Sol.
$= 3 / 4$
$= 3 / 4 \times 100\%$

$= 75\%$

2(2). Convert 2 : 3 to percentage.

Sol.
$= 2 / 3$
$= 2 / 3 \times \times 100\%$
$= 66 \ 2 / 3\%$

3. 72% of 25 students are good in mathematics. How many students are not good in Mathematics?

Sol.
Total number of students = 25 Number of good students in mathematics = 72% of 25
$= \frac{72}{100} \frac{72}{100} \times \times 25 = 18$
Number of students not good in mathematics = 25 - 18 = 7

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?

Sol.
Let the total number of matches be x.
According to question,
40% of total matches = 10
$\Rightarrow \Rightarrow$ 40% of x = 10
$\Rightarrow \frac{40}{100} \times x = 10 \Rightarrow \frac{40}{100} \times x = 10$
$\Rightarrow x = \frac{10 \times 100}{40} = 25 \Rightarrow x = \frac{10 \times 100}{40} = 25$
Hence, 25 matches were played in all.

5. If Chameli had ₹ 600 left after spending 75% of her money, how much did she have in the beginning?

Sol.
Total percentage of money she didn't spent
= 100% - 75% = 25%
According to question,
$\Rightarrow$$\Rightarrow$ 25% = 600
$\Rightarrow 1\% = \frac{600}{25} \Rightarrow 1\% = \frac{600}{25}$
$\Rightarrow 100\% = \frac{600}{25} \times 100 \Rightarrow 100\% = \frac{600}{25} \times 100$ = 2400
Hence, the money she had in the beginning was ₹ 2400.

6. If 60% people in a city like cricket, 30% like football and the remaining like other games, then what per cent 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.

Sol.
Number of people who like cricket = 60%
Number of people who like football = 30%
Number of people who like other games
= 100% − (60% + 30%)
= 100% − 90%
= 10%
Total number of people = 50 lakhs = 50,00,000
Now number of people who like cricket
= 60% of 50,00,000
$= \frac{60}{100} \times 5000000 = \frac{60}{100} \times 5000000$
= 30,00,000 or, 30 lakh
Number of people who like football
= 30% of 50,00,000
$= \frac{30}{100} \times 5000000 = \frac{30}{100} \times 5000000$
= 15,00,000 or, 15 lakh
Number of people who like the other games
= 10% of 50,00,000
$= \frac{10}{100} \times 5000000 = \frac{10}{100} \times 5000000$
= 5,00,000 or, 5 lakh

1(1). Find the ratio of the speed of a cycle 15 km per hour to the speed of scooter 30 km per hour.

Sol.
Speed of cycle = 15km/hr
Speed of scooter = 30km/hr
Hence ratio of speed of cycle to that of scooter = 15 : 30
$= \frac{15}{30} = \frac{15}{30}$
$= \frac{1}{2} = \frac{1}{2}$
= 1 : 2

1(2). Find the ratio of the 5 m to 10 km.

Sol.
∵ 1km = 1000m

∴ 10 km = 10 ×× 1000 m = 10000 m

Ratio = 5 m : 10 km

= 5 m : 10000 m

= 5 : 10000

=510000=510000

=120000=120000

= 1 : 2000

1(3). Find the ratio of the 50 paise to ₹ 5.

Sol.
∵ ₹1 = 100 paise

₹. 5 = 5 ×× 100 = 500 paise

∴ Ratio of 50 paise to ₹ 5

= 50 paise : ₹ 5

= 50 paise : 500 paise

= 50 : 500

=50500=50500

=110=110

= 1 : 10

2(1). Convert 3 : 4 to percentage.

Sol.
=34=34

=34×100%=34×100%= 3434 ×× 100%

= 75%

2(2). Convert 2 : 3 to percentage.

Sol.
=23=23

= 2323 ×× 100%

=6623%=6623%

3. 72% of 25 students are good in mathematics. How many students are not good in Mathematics?

Sol.
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

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?

Sol.
Let the total number of matches be x.
According to question,
40% of total matches = 10
$\Rightarrow$ 40% of x = 10
$\Rightarrow \frac{40}{100} \times x = 10$
$\Rightarrow x = 10 \times \frac{100}{40} = 25$
Hence, 25 matches were played in all.

5. If Chameli had ₹ 600 left after spending 75% of her money, how much did she have in the beginning?

Sol.
Total percentage of money she didn't spent
= 100% - 75% = 25%
According to question,
$\Rightarrow$ 25% = 600
$\Rightarrow 1\% = \frac{600}{25}$
$\Rightarrow 100\% = \frac{600}{25} \times 100$ = 2400
Hence, the money she had in the beginning was ₹ 2400.

6. If 60% people in a city like cricket, 30% like football and the remaining like other games, then what per cent 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.

Sol.
Number of people who like cricket = 60%
Number of people who like football = 30%
Number of people who like other games
= 100% − (60% + 30%)
= 100% − 90%
= 10%
Total number of people = 50 lakhs = 50,00,000
Now number of people who like cricket
= 60% of 50,00,000
= $\frac{60}{100} \times 5000000$
= 30,00,000 or, 30 lakh
Number of people who like football

= 30% of 50,00,000

$=\frac{30}{100}\times 5000000=\frac{30}{100}\times 5000000$

= 15,00,000 or, 15 lakh

Number of people who like the other games

= 10% of 50,00,000

$=\frac{10}{100}\times 5000000=\frac{10}{100}\times 5000000$

= 5,00,000 or, 5 lakh

EX: 8.3

1(1). Calculate the amount and compound interest on ₹10,800 for 3 years at $12\frac{1}{2}\%$ $12\frac{1}{2}\%$ per annum compounded annually.

Sol.

By using year by year calculation

S.I. on ₹ 10800 at $12\frac{1}{2}\%$ $12\frac{1}{2}\%$ per annum for 1 year

$=10800\times\frac{25}{2}\times\frac{1}{100}=10800\times\frac{25}{2}\times\frac{1}{100}$ = ₹1350

∴ Amount at the end of 1st year

= ₹ 10800 + ₹ 1350 (A = P + S.I.)

= ₹ 12150

= Principle for 2nd year. S.I. on ₹ 12150 at $12\frac{1}{2}\%$ $12\frac{1}{2}\%$ per annum for 1 year

$=12150\times\frac{25}{2}\times\frac{1}{100}=12150\times\frac{25}{2}\times\frac{1}{100}$

= ₹ 1518.75

∴ Amount at the end of 2nd year

= ₹ 12150 + ₹ 1518.75

= ₹ 13668.75

= Principle for 3rd year

S.I. on ₹ 13668.75 at $12\frac{1}{2}\%$ $12\frac{1}{2}\%$ per annum for 1 year

$=13668.75\times\frac{25}{2}\times\frac{1}{100}=13668.75\times\frac{25}{2}\times\frac{1}{100}$

= ₹ 1708.59

∴ Amount at the end of 3rd year

= ₹ 13668.75 + ₹ 1708.59

= ₹ 15377.34

this is the required amount.

Now,

C.I. = ₹ 15377.34 – ₹ 10800

= ₹ 4577.34

OR

C.I. = ₹ 1350 + ₹ 1518.75 + ₹ 1708.59

= ₹ 4577.34

1(2). Calculate the amount and compound interest on ₹ 18,000 for $2\frac{1}{2}$ years at 10% per annum compounded annually.

Sol.
By using year by year calculation
S.I. on ₹ 18000 at 10% per annum for 1 year
$=\dfrac{18000\times10\times1}{100}=₹1800$

∴ Amount at the end of 1st year
= ₹ 18000 + ₹ 1800
= ₹ 19800
= Principle for 2nd year.
S.I. on ₹ 19800 at 10% per annum for 1 year
$=\dfrac{19800\times10\times1}{100}$
= ₹ 1980

∴ Amount at the end of 2nd year
= ₹ 19800 + ₹ 1980
= ₹ 21780
= Principle for 3rd year
S.I. on ₹ 21780 at 10% per annum for $\frac{1}{2}$ year
$=\dfrac{21780\times10\times1}{2\times100}$
= ₹ 1089

∴ Amount at the end of $2\frac{1}{2}$ years
= ₹ 21780 + ₹ 1089
= ₹ 22869
this is the required amount.
Now,
C.I. = ₹ 22869 – ₹ 18000
= ₹ 4869.

1(3). Calculate the amount and compound interest on ₹ 62,500 for $1\frac{1}{2}$ years at 8% per annum compounded half yearly.

Sol.
By using compound interest formula
P = ₹ 62500
R = 8% p.a. $=\dfrac{1}{2}\times8\%$ per half year
= 4% per half year
$n=1\frac{1}{2}$ year
$=1\frac{1}{2}\times2$ half years = 3 half years
$\therefore A=P\left(1+\dfrac{R}{100}\right)^n=62500\left(1+\dfrac{4}{100}\right)^3$
$=62500\left(1+\dfrac{1}{25}\right)^3=62500\left(\dfrac{26}{25}\right)^3$
$=62500\times\dfrac{26}{25}\times\dfrac{26}{25}\times\dfrac{26}{25}$
= ₹ 70304
∴ C.I. = A – P = ₹ 70304 – ₹ 62500
= ₹ 7804.

1(4). Calculate the amount and compound interest by using compound interest formula on ₹ 8,000 for 1 year at 9% per annum compounded half yearly.

Sol.
By using compound interest formula
P = ₹ 8000

R = 9% p.a. $= \frac{9}{2}\% = \frac{9}{2}\%$ per half year

n = 1 year = 1 × 2 half years
= 2 half years

$\therefore A = P\left(1 + \frac{R}{100}\right)^n = 8000\left(1 + \frac{9}{2 \times 100}\right)^2$

$= 8000\left(1 + \frac{9}{200}\right)^2 = 8000\left(\frac{209}{200}\right)^2$

$= 8000 \times \frac{209}{200} \times \frac{209}{200}$

= ₹ 8736.20

$\therefore$ C.I. = A − P

= ₹ 8736.20 − ₹ 8000

= ₹ 736.20.

1(5). Calculate the amount and compound interest by using compound interest formula on ₹10,000 for 1 year at 8% per annum compounded half yearly.

Sol.
By using compound interest formula
P = ₹ 10000

R = 8% per annum

$= \frac{8}{2}\% = \frac{8}{2}\%$ per half year

= 4% per half year

n = 1 year = 1 ×× 2 half years
= 2 half years

$\therefore A = P\left(1 + \frac{R}{100}\right)^n = 10000\left(1 + \frac{4}{100}\right)^2$

$= 10000\left(1 + \frac{1}{25}\right)^2 = 10000\left(\frac{26}{25}\right)^2$

$= 10000 \times \frac{26}{25} \times \frac{26}{25}$

= ₹ 10816

$\therefore$ C.I. = A − P

= ₹10816 − ₹ 10000

= ₹ 816

2. Kamala borrowed ₹ 26400 from a bank to buy a scooter at a rate of 15% p.a. compounded yearly. What amount will she pay at the end of 2 years and 4 months to clear the loan?
(Hint: Find A for 2 years with interest is compounded yearly and then find SI on the 2nd year amount for $\frac{4}{12}$ years)

Sol.

P = ₹ 26400

R = 15% p.a.

n = 2 years

$\therefore A=P\left(1+\frac{R}{100}\right)^n=26400\left(1+\frac{15}{100}\right)^2$

$=26400\left(1+\frac{3}{20}\right)^2=26400\left(\frac{23}{20}\right)^2$

$=26400\times\frac{23}{20}\times\frac{23}{20}=$ ₹ 34914

S.I. on ₹ 34914 at 15% p.a. for 4 months

$=\frac{34914\times15\times1}{3\times100}=$ ₹ 1745.70

$\therefore$ Required amount = ₹ 34914 + ₹ 1745.70

= ₹ 36659.70

Hence, the amount that Kamala will pay is ₹ 36659.70.

3. Fabina borrow ₹ 12500 at 12% per annum for 3 years at simple interest and Radha borrows the same amount for the same time period at 10% per annum, compounded annually. Who pays interest and by how much?

Sol.

For Fabina

S.I. on ₹ 12500 at 12% p.a. for 3 years

$=\frac{12500\times12\times3}{100}=$ ₹ 4500

For Radha

P = ₹ 12500

R = 10% per annum

n = 3 years

$\therefore A=P\left(1+\frac{R}{100}\right)^n=12500\left(1+\frac{10}{100}\right)^3$

$=12500\left(1+\frac{1}{10}\right)^3=12500\left(\frac{11}{10}\right)^3$

$=12500\times\frac{11}{10}\times\frac{11}{10}\times\frac{11}{10}$

= ₹ 16637.50

$\therefore$ C.I. = A – P

= ₹ 16637.50 – ₹ 12500

= ₹ 4137.50

Difference between C.I. and S.I.

= ₹ 4500 – ₹ 4137.50

= ₹ 362.50

Hence, Fabina pays more by ₹ 362.50

4. I borrowed ₹12000 from Jamshed at 6% per annum simple interest for 2 years. Had I barrowed this sum at 6% per annum compound interest, what excess amount would I have to pay?

Sol.

At simple interest

S.I. on ₹ 1200 at 6% per annum for 2 years

$=\frac{12000\times6\times2}{100}=$ ₹1440

At compound interest

P = ₹ 12000

R = 6% per annum

n = 2 years

$$\therefore A = P\left(1+\frac{R}{100}\right)^n = 12000\left(1+\frac{6}{100}\right)^2$$

$$= 12000\left(1+\frac{3}{50}\right)^2 = 12000\left(\frac{53}{50}\right)^2$$

$$= 12000 \times \frac{53}{50} \times \frac{53}{50} = ₹13483.20$$

$\therefore$ C.I. = A – P

= ₹ 13483.20 – ₹ 12000

= ₹ 1483.20

$\therefore$ Excess amount = ₹1483.20 – ₹1440

= ₹43.20

Hence, I would have to pay to him an excess amount of ₹43.20.

5(1). Vasudevan invested ₹60000 at an interest rate of 12% per annum compounded half yearly. What amount would he get after 6 months.

Sol.
We have,

Time = 6 months = $\frac{12}{12}$ year

P = ₹ 60000

R = 12% per annum

$= \frac{12 \times 1}{2}\%$ per half year

= 6% per half year

n = 1 half year

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

$$A = 60000\left(1+\frac{6}{100}\right)^1$$

$$= 60000 \times \frac{106}{100}$$

= ₹ 63600

Hence, he would get ₹ 63600 after 6 months.

5(2). Vasudevan invested ₹ 60000 at an interest rate of 12% per annum compounded half yearly. What amount would he get after 1 year.

Sol.
It is given that

P = ₹ 60000

R = 12% per annum

$= \frac{12}{2}\%$ per half year

= 6% per half year

for n = 1 year

= 1 × 2 half years

= 2 half years

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

$$= 60000\left(1+\frac{6}{100}\right)^2$$

$$= 60000\left(1+\frac{3}{50}\right)^2$$

$= 60000(\frac{53}{50})2 = 60000(\frac{53}{50})^2$

$= 60000 \times \frac{53}{50} \times \frac{53}{50} = 60000 \times \frac{53}{50} \times \frac{53}{50}$

= ₹ 67416

Hence, he would get ₹ 67416 after 1 year.

6(1). Arif took a loan of ₹ 80,000 from a bank. If the rate of interest is 10% per annum, find the amount he would be paying after $1\frac{1}{2}$ years if the interest is compounded annually.

Sol.
We have,
Compounded annually
P = ₹ 80000
R = 10% per annum
n = 1 year
$\therefore A = P(1 + \frac{R}{100})^n \therefore A = P(1 + \frac{R}{100})^n$

$= 80000(1 + \frac{1}{10})1 = 80000(1 + \frac{1}{10})^1$

$= 80000 \times \frac{11}{10} = 80000 \times \frac{11}{10}$

= ₹ 88000

S.I. on ₹ 88000 at 10% per annum for $\frac{1}{2}$ year

S.I. $= \frac{88000 \times 10 \times 1}{2 \times 100} = \frac{88000 \times 10 \times 1}{2 \times 100}$

= ₹ 4400

$\therefore$ Required amount = ₹ 88000 + ₹ 4400

= ₹ 92400

6(2). Arif took a loan of ₹80,000 from a bank. If the rate of interest is 10% per annum, find the difference in amount he would be paying after $1\frac{1}{2}$ years if the interest is compounded half yearly.

Sol.
P = ₹80000
R = 10% per annum
R = $\frac{10}{2}\% \frac{10}{2}\%$ = 5% per half-year
n = $1\frac{1}{2}$ years
$= 1\frac{1}{2} \times 2 = 1\frac{1}{2} \times 2$ half years
= 3 half years
$\therefore A = P(1 + \frac{R}{100})^n = 80000(1 + \frac{5}{100})3 \therefore A = P(1 + \frac{R}{100})^n = 80000(1 + \frac{5}{100})^3$

$= 80000(1 + \frac{1}{20})3 = 80000(\frac{21}{20})3 = 80000(1 + \frac{1}{20})^3 = 80000(\frac{21}{20})^3$

$= 80000 \times \frac{21}{20} \times \frac{21}{20} \times \frac{21}{20} = 80000 \times \frac{21}{20} \times \frac{21}{20} \times \frac{21}{20}$

= ₹92610

This is the required amount
Difference in amounts = ₹92610 – ₹92400 = ₹210
Hence, the difference in amounts is ₹210

7(1). Maria invested ₹ 8,000 in a business. She would be paid interest at rate of 5% per annum compounded annually. Find the amount credited against her name at the end of the second year.

Sol.

P = ₹ 8000

R = 5% per annum

n = 2 years

$$\therefore A = P\left(1+\frac{R}{100}\right)^n = 8000\left(1+\frac{5}{100}\right)^2$$

$$= 8000\left(1+\frac{1}{20}\right)^2 = 8000\left(\frac{21}{20}\right)^2$$

$$= 8000 \times \frac{21}{20} \times \frac{21}{20} = ₹\ 8820$$

Hence, the amount credited against his name at the end of second year is = ₹ 8820.

7(2). Maria invested ₹ 8,000 in a business. She would be paid interest at a rate of 5% per annum compounded annually. Find the interest for the 3rd year.

Sol.

It is given that Principal (P) = ₹8000, Rate of Interest (R) = 5%, Time, n = 3 years

We know that,

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

Amount after 2 years $= 8000\left(1+\frac{5}{100}\right)^2$

= ₹8,820

Amount after 3 years $= 8000\left(1+\frac{5}{100}\right)^3$

= ₹9,261

Interest for 3rd year = (Amount at the end of 3rd year) – (Amount at the end of 2nd year)

= ₹9,261 – ₹8,820

= ₹441

8. Find the amount and the compound interest on ₹ 10000 for $1\frac{1}{2}$ years at 10% per annum, compounded half yearly. Would this interest be more than the interest he would get if it was compounded annually?

Sol.

When Compounded half yearly

P = ₹ 10000

R = 10% per annum

$= \frac{10}{2}\%$ per half year

= 5% per half year

$n = 1\frac{1}{2}\ \text{year}$

$= \frac{3}{2} \times 2$ half years

= 3 half years

$$\therefore A = P\left(1+\frac{R}{100}\right)^n = 10000\left(1+\frac{5}{100}\right)^3$$

$$= 10000\left(1+\frac{1}{20}\right)^3 = 10000\left(\frac{21}{20}\right)^3$$

$$= 10000 \times \frac{21}{20} \times \frac{21}{20} \times \frac{21}{20}$$

= ₹ 11576.25

This is required amount.

Now,

C.I. = A – P

= ₹ 11576.25 – ₹ 10000

= ₹ 1576.25 this is the required C. I.

When Compounded annually

P = ₹ 10000

R = 10% per annum

n = 1 year

$\therefore A = P\left(1 + \dfrac{R}{100}\right)^n = 10000\left(1 + \dfrac{10}{100}\right)^1$

$= 10000\left(1 + \dfrac{1}{10}\right)^1 = 10000 \times \dfrac{11}{10}$

= ₹ 11000

= Principal for next $\dfrac{1}{2}$ year

$\therefore$ Interest for first year = A – P

= ₹ 11000 – ₹ 10000

= ₹ 1000

S.I. on ₹ 11000 at 10% per annum for $\dfrac{1}{2}$ year

$= \dfrac{11000 \times 10}{12 \times 100}$ = ₹ 550

$\therefore$ Total compound interest

= ₹ 1000 + ₹ 550

= ₹ 1550

Hence, the interest when compounded half yearly would be more than the interest when compounded annually.

9. Find the amount which Ram will get on ₹ 4096, if he gave it for 18 months at $12\dfrac{1}{2}\%$ per annum, interest being compounded half yearly.

Sol.

P = Rs. 4096

$R = 12\dfrac{1}{2}\%$ per annum

$= \dfrac{25}{2}\%$ per annum

$= \dfrac{1}{2} \times \dfrac{25}{2}\%$ per half year

$= \dfrac{25}{4}\%$ per half year

n = 18 months $= \dfrac{18}{6}$ half years

= 3 half years.

$\therefore A = P\left(1 + \dfrac{R}{100}\right)^n = 4096\left(1 + \dfrac{25}{4 \times 100}\right)^3$

$= 4096\left(1 + \dfrac{1}{16}\right)^3 = 4096\left(\dfrac{17}{16}\right)^3$

$= 4096 \times \dfrac{17}{16} \times \dfrac{17}{16} \times \dfrac{17}{16} = Rs. 4913$

Hence, the required amount is Rs. 4913

10(1). The population of a place increased to 54,000 in 2003 at a rate of 5% per annum. Find the population in 2001.

Sol.

Let the population in 2001 be P.

R = 5% p.a.

n = 2 years

$\therefore A = P\left(1 + \dfrac{R}{100}\right)^n = P\left(1 + \dfrac{5}{100}\right)^2$

$= P\left(1 + \dfrac{1}{20}\right)^2 = P\left(\dfrac{21}{20}\right)^2$

According to question,

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

$\therefore P = \dfrac{54000}{\left(\frac{20}{21}\right)^2} = 54000 \times \frac{20}{21} \times \frac{20}{21} = 48980$ (approx)

Hence, the population in 2001 was 48980.

10(2). The population of a place increased to 54,000 in 2003 at a rate of 5% per annum. what would be its population in 2005.

Sol.
P = 54000
R = 5% p.a.
n = 2 years

$\therefore A = P\left(1+\frac{R}{100}\right)^n = 54000\left(1+\frac{5}{100}\right)^2$

$= 54000\left(1+\frac{1}{20}\right)^2 = 54000\left(1+\frac{21}{20}\right)^2$

$= 54000 \times \frac{21}{20} \times \frac{21}{20} = 59535$

Hence, the population in 2005 would be 59535.

11. In a Laboratory, the count of bacteria in 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.

Sol.
P = 506000
R = 2.5% per hour
h = 2 hour

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

$= 506000\left(1+\frac{1}{40}\right)^2 = 506000\left(\frac{41}{40}\right)^2$

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

$= 531616$ (approx.)

Hence, the count of bacteria at the end of 2 hours is 531616 (approx.)

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

Sol.
P = ₹ 42000
R = 8% per annum
n = 1 year

$\therefore A = P\left(1-\frac{R}{100}\right)^n$

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

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

$= 42000 \times \frac{23}{25}$

$= ₹ 38640$

Hence, its value after 1 year is ₹ 38640.

Worksheet
Class 08 - Mathematics (Comparing quantities)

General Instructions: All questions are compulsory.

Q.1 to Q.2 carries one mark each.

Q.3 to Q.7 carries two marks each.

Q.8 and Q.9 carries three marks each.

Q.10 to Q.12 carries four marks each.

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1. A player won 70% of the cricket matches whenever he was in the team. In his total career, he lost 45 matches. How many matches he played overall?

2. If 8.5% of a number is 51, then find the number.

3. **State whether the following statements are True/False:**
   a. If a discount is given on an item, Sales Tax is calculated on the discounted price.
   b. The charges paid extra to the S.P. of an article is called over head expenses.
   c. The C.P. of an article whose S.P. is ₹150 at a gain of 50% is ₹ 100.
   d. The amount paid for an item costing ₹ 100 with 8% discount is ₹ 108.

4. **Fill in the blanks:**

   a. If S.P < C.P, then it is _____.
   b. If S.P > C.P, then it is _____.
   c. C.P – S.P = _____.
   d. S.P. – C.P = _____.

5. Find selling price (SP) if a profit of 5% is made on a lawn mower bought at Rs. 1150 with Rs. 50 as transportation charges.

6. Find interest and amount to be paid on Rs. 15000 at 5% per annum after 2 years.

7. 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 ?

8. Find the Simple Interest and amount on ₹ 5000 for 6 months at the rate of 5% per annum.

9. A farmer buys a plot of agricultural land for ₹ 4, 50,000. He sells one-third at a loss of 15% and two-fifth at a gain of 20%. At what price must he sell the remaining land, so as to make an overall profit of 10%?

10. If 60% people in a city like cricket, 30% like football and the remaining like other games, then what per cent 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.

11. Maria invested Rs. 8000 in a business. She would be paid interest at rate of 5% per annum compounded annually. Find (i) the amount credited against her name at the end of the second year. (ii) the interest for the 3rd year.