

CHAPTER

7

VIII CLASS-NCERT (2024-25)

Comparing Quantities (Notes)

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- Comparing two quantities of the same kind by division is called 'Ratio' of those quantities.
- The ratio of two numbers 'a' and 'b' is $a \div b = \frac{a}{b} = a : b$
- $a : b$ is read as "a is to b". a is called Antecedent, b is called Consequent.
- Proportion:** The equality of ratios is called proportion. If two ratios $a : b$ and $c : d$ are equal, then we represent it as $a : b :: c : d$ [We read 'a' is to 'b' is as 'c' is to 'd']
- $a : b :: c : d$ is also written as $a : b = c : d$
- If $a : b = c : d$ then a, b, c, d are in proportion. a, d are extremes and b, c are means.
- If $a : b = c : d \Rightarrow \frac{a}{b} = \frac{c}{d} \Rightarrow a \times d = b \times c$
(ie) The product of extremes = the product of Means
- For any two ratios $a : b$ and $c : d$, the **compound ratio** is $a \times c : b \times d$.
- Direct proportion:** In two quantities when one quantity increases, then the other also increases or if one quantity decreases, then the other also decreases in the same proportion, then the two quantities are said to be in direct proportion.
- When x and y are in direct proportion, then
$$\frac{x}{y} = k \text{ or } x = k \times y \text{ (} k \text{ is called constant of proportion)}$$
- Inverse Proportion :**
If in two quantities, when one quantity increases, then the other quantity decreases in the same proportion or vice versa, then the two quantities are said to be in inverse proportion.
- When x and y are in Inverse proportion, then
$$x \times y = k \text{ or } x = \frac{k}{y} \text{ or } y = \frac{k}{x}$$
- Percentage:** The word "percent" means "out of hundred". The symbol "%" is used to represent 'Percentage'.
- $20\% = \frac{20}{100} = \frac{1}{5}$ [Simplified form] = 1 : 5 [Ratio] = 0.2 [Decimal form]

PROFIT OR LOSS:

- The price at which you sell is known as the 'Selling Price'. It is written in short as SP.
- The buying price of any item is known as its 'Cost Price'. It is written in short as CP
- If selling price is higher than Cost Price, then we get profit. (S.P > C.P)
$$\text{Profit} = S.P - C.P$$
- If cost price is higher than selling price, then we get loss. (C.P > S.P)

$$\text{Loss} = C.P - S.P$$

19. Cost price is equal to Selling price, then we get neither profit nor loss

$$20. \text{ Profit Percentage} = \frac{\text{Profit}}{\text{Cost price}} \times 100\%$$

$$21. \text{ Loss Percentage} = \frac{\text{Loss}}{\text{Cost price}} \times 100\%$$

Discount

22. The price shown on the item is called the 'Marked price'(M.P)

23. The "Discount" is always calculated on 'Marked price'

24. Discount = Marked price - Selling price = M.P - S.P

$$25. \text{ Discount percentage} = \frac{\text{Discount}}{\text{Marked price}} \times 100\%$$

Simple Interest:

26. The excess amount we paid on lending amount is called interest and the lending amount is called principal.

$$27. \text{ Simple Interest}(I) = \frac{P \times T \times R}{100}$$

P = Principal amount , R = Rate of interest, T = time

$$28. \text{ Total amount}(A) = P \left(1 + \frac{TR}{100} \right)$$

Example 1: A picnic is being planned in a school for Class VII. Girls are 60% of the total number of students and are 18 in number. The picnic site is 55 km from the school and the transport company is charging at the rate of ₹ 12 per km. The total cost of refreshments will be ₹ 4280.

Sol: Let the total number of students = x

Girls = 18

60% of $x = 18$

$$\frac{60}{100} \times x = 18$$

$$x = \frac{18 \times 100}{60} = 30$$

Number of students = 30

So, the number of boys = $30 - 18 = 12$.

1. The ratio of the number of girls to the number of boys in the class = $18:12 = 3:2$.

2. The cost per head if two teachers are also going with the class?

Transportation charge = Distance both ways \times Rate

$$= ₹ (55 \times 2) \times 12 = ₹ 110 \times 12 = ₹ 1320$$

Total expenses = Refreshment charge + Transportation charge

$$= ₹ 4280 + ₹ 1320 = ₹ 5600$$

Total number of persons = 18 girls + 12 boys + 2 teachers = 32 persons

Method II:

60% \rightarrow 18

100% \rightarrow x

$$x = \frac{100}{60} \times 18 = 30$$

The amount spent for 1 person = $\frac{5600}{32} = ₹175$

3. If their first stop is at a place 22 km from the school, what per cent of the total distance of 55 km is this? What per cent of the distance is left to be covered?

Sol: Total distance=55 km, Distance for first stop=22km

Percentage of distance covered for first stop = $\frac{22}{55} \times 100\% = 2 \times 20\% = 40\%$

Therefore, the percent distance left to be travelled = $100\% - 40\% = 60\%$.

TRY THESE

In a primary school, the parents were asked about the number of hours they spend per day in helping their children to do homework. There were 90 parents who helped for $\frac{1}{2}$ hour to $1\frac{1}{2}$ hours. The distribution of parents according to the time for which, they said they helped is given in the adjoining figure ; 20% helped for more than $1\frac{1}{2}$ hours per day; 30% helped for $\frac{1}{2}$ hour to $1\frac{1}{2}$ hours; 50% did not help at all. Using this, answer the following: (i) How many parents were surveyed? (ii) How many said that they did not help? (iii) How many said that they helped for more than $1\frac{1}{2}$ hours?

Sol: Let number of parents= x

(i) Given number of parents helped for $\frac{1}{2}$ hour to $1\frac{1}{2}$ hour = 90

$$30\% \text{ of } x = 90$$

$$\frac{30}{100} \times x = 90$$

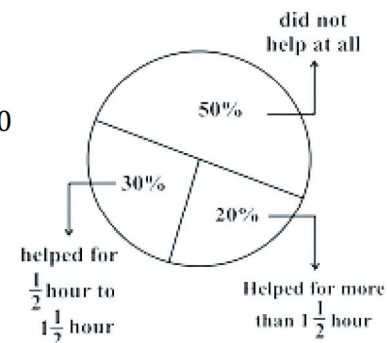
$$x = \frac{90 \times 100}{30} = 300$$

(ii) Number of parents did not help=50% of 300

$$= \frac{50}{100} \times 300 = 50 \times 3 = 150$$

(iii) Number of parents helped for more than $1\frac{1}{2}$ hours = 20% of 300

$$= \frac{20}{100} \times 300 = 20 \times 3 = 60$$



Alternate method:

$$30\% \rightarrow 90$$

$$100\% \rightarrow ?$$

$$= \frac{100}{30} \times 90 = 300$$

EXERCISE 7.1

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.

Sol: Ratio of speeds=15 km per hour : 30 km per hour

$$=15:30=1:2$$

b) 5 m to 10 km

Sol: Ratio=5 m : 10 km

$$1 \text{ km}=1000 \text{ m}$$

$$=5\text{m}:10000\text{m}$$

$$=5:10000$$

$$=1:2000$$

c) **50 paise to ₹ 5**

Sol: Ratio = 50 paise : ₹ 5

$$=50 \text{ paise} : 500 \text{ paise}$$

$$=50:500=1:10$$

$$\boxed{\text{₹}1=100 \text{ paise}}$$

2. **Convert the following ratios to percentages.**

a) **3:4**

Sol: $3:4 = \frac{3}{4} = \frac{3}{4} \times 100\% = 3 \times 25\% = 75\%$

b) **2:3**

Sol: $2:3 = \frac{2}{3} = \frac{2}{3} \times 100\% = \frac{200}{3}\% = 66\frac{2}{3}\%$

3. **72% of 25 students are interested in mathematics. How many are not interested in mathematics?**

Sol: Total number of students = 25

Number of students interested in mathematics = 72% of 25

$$= \frac{72}{100} \times 25 = \frac{72}{4} = 18$$

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

Alternate method:

Number of students not interested in mathematics = $(100 - 72)\%$ of 25

$$= 28\% \text{ of } 25 = \frac{28}{100} \times 25 = \frac{28}{4} = 7$$

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 played = x

Wined matches = 10 and win percentage = 40%

$$40\% \text{ of } x = 10$$

$$\frac{40}{100} \times x = 10$$

$$x = \frac{10 \times 100}{40} = 25$$

$$40\% \rightarrow 10$$

$$100\% \rightarrow ?$$

$$= \frac{100}{40} \times 10 = 25$$

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

Sol: Let the money beginning at Chameli = ₹ x

Spending = 75% left = $100 - 75 = 25\%$

Given she left with ₹ 600

$$25\% \rightarrow 600$$

$$100\% \rightarrow ?$$

$$= \frac{100}{25} \times 600 = 2400$$

$$25\% \text{ of } x = 600$$

$$\frac{25}{100} \times x = 600$$

$$x = \frac{600 \times 100}{25} = 6004 = 2400$$

Hence Chameli had ₹ 2400 in the beginning.

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 is 50 lakh, find the exact number who like each type of game.**

Sol: Cricket=60% , football=30%

The other games= (100-60-30)%=10%

The total number of people=50,00,000

Number of people who like cricket=60% of 50,00,000

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

Number of people who like football=30% of 50,00,000

$$= \frac{30}{100} \times 50,00,000 = 30 \times 50,000 = 15,00,000$$

Number of people who like other games=10% of 50,00,000

$$= \frac{10}{100} \times 50,00,000 = 10 \times 50,000 = 5,00,000$$

Discounts

(i) Discount is a reduction given on the Marked Price (MP) of the article

(ii) Discount = Marked price - Sale price=MP-SP

(iii) Discount percent = $\frac{\text{Discount}}{\text{Marked price}} \times 100\%$

Example 2: An item marked at ₹840 is sold for ₹ 714. What is the discount and discount %?

Sol: Marked price (M.P)= ₹840

Sale price (S.P)= ₹714

Discount = Marked Price - Sale Price

$$= ₹ 840 - ₹ 714 = ₹ 126$$

Discount percent = $\frac{\text{Discount}}{\text{Marked price}} \times 100\%$

$$= \frac{126}{840} \times 100\% = 15\%$$

MP is 840 the discount is 126

MP is 100 the discount is ?

$$= \frac{126}{840} \times 100 = 15$$

Discount%=15%

Example 3: The list price of a frock is ₹220. A discount of 20% is announced on sales. What is the amount of discount on it and its sale price.

Sol: The list price of a frock is = 220

Discount % = 20%

$$\text{Discount} = 20\% \text{ of } 220 = \frac{20}{100} \times 220 = ₹44$$

$$\text{Sale price} = 80\% \text{ of } 220 = \frac{80}{100} \times 220 = ₹176$$

$$\begin{aligned} \text{Sale price} &= \text{List price} - \text{Discount} \\ &= 220 - 44 = 176 \end{aligned}$$

TRY THESE

1. A shop gives 20% discount. What would the sale price of each of these be?

(a) A dress marked at ₹ 120

Sol: MP of dress = ₹120

Discount = 20% of 120

$$= \frac{20}{100} \times 120 = 2 \times 12 = ₹24$$

Sale price = Marked price - Discount

$$= 120 - 24 = ₹96$$

Alternate Method:

If MP is ₹100 then SP is ₹80

When MP is ₹120 then SP is ?

$$SP = \frac{80}{100} \times 120 = 8 \times 12 = ₹96$$

(b) A pair of shoes marked at ₹ 750

Sol: MP of shoes = ₹750

Discount = 20% of 750

$$= \frac{20}{100} \times 750 = 2 \times 75 = ₹150$$

Sale price = Marked price - Discount

$$= 750 - 150 = ₹600$$

Alternate Method:

If MP is ₹100 then SP is ₹80

If MP is ₹ 750 then SP is ?

$$SP = \frac{80}{100} \times 750 = 8 \times 75 = ₹600$$

(c) A bag marked at ₹ 250

Sol: MP of a bag = ₹250

Discount = 20% of 250

$$= \frac{20}{100} \times 250 = 2 \times 25 = ₹50$$

Sale price = Marked price - Discount

$$= 250 - 50 = ₹200$$

Alternate Method:

If MP is ₹100 then SP is ₹80

If MP is ₹ 250 then SP is ?

$$SP = \frac{80}{100} \times 250 = 8 \times 25 = ₹200$$

2. A table marked at ₹15,000 is available for ₹ 14,400. Find the discount given and the discount per cent.

Sol: MP of a table = ₹15000

SP of table = ₹14400

Discount = MP - SP

$$= 15000 - 14400 = ₹600$$

$$\text{Discount per cent} = \frac{\text{Discount}}{\text{MP}} \times 100\%$$

$$= \frac{600}{15000} \times 100 = \frac{60}{15} = 4\%$$

3. An Amirah is sold at ₹ 5,225 after allowing a discount of 5%. Find its marked price.

Sol: SP of Amirah = ₹5225

Discount percent = 5%

If SP is ₹95 then MP is ₹100

If SP is ₹5225 then MP is ?

$$\text{MP of almirah} = \frac{100}{95} \times 5225 = 100 \times 55 = ₹5500$$

Sales Tax/Value Added Tax/Goods and Services Tax

(i) 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

(ii) GST stands for Goods and Services Tax and is levied on supply of goods or services or both

(iii) There is another type of tax which is included in the prices known as Value Added Tax (VAT).

Example 4: (Finding Sales Tax) The cost of a pair of roller skates at a shop was ₹ 450. The sales tax charged was 5%. Find the bill amount.

Sol: CP of a pair of roller skates = ₹450

Sales tax = 5%

$$\text{Sales tax on roller skates} = 5\% \text{ of } 450 = \frac{5}{100} \times 450 = ₹22.50$$

$$\text{Bill amount} = \text{CP} + \text{sales tax} = ₹450 + ₹22.50 = ₹472.50$$

Example 5: (Value Added Tax (VAT)) Waheeda bought an air cooler for ₹ 3300 including a tax of 10%. Find the price of the air cooler before VAT was added.

Sol: If the price without VAT is ₹100 then price including VAT is ₹ 110.

Now, when price including VAT is ₹ 110, original price is ₹ 100

$$\text{Hence when price including tax is ₹ 3300, the original price} = \frac{100}{110} \times 3300 = ₹3000$$

Example 6: Salim bought an article for ₹784 which included GST of 12%. What is the price of the article before GST was added?

Sol: GST = 12%

When the selling price is ₹ 112 then original price = ₹ 100.

$$\text{When the selling price is ₹ 784, then original price} = \frac{100}{112} \times 784 = ₹700$$

The price of the article before GST = ₹700

THINK, DISCUSS AND WRITE

1. **Two times a number is a 100% increase in the number. If we take half the number what would be the decrease in per cent?**

Sol: let the number be 100

If the number is 100% increased the new number = 100 + 100 = 200 = Two times the number.

If we take half the number the new number = 50

The number decrease in 50%

2. **By what per cent is ₹2,000 less than ₹2,400? Is it the same as the per cent by which ₹ 2,400 is more than ₹ 2,000?**

Sol: The percent is ₹ 2000 less than ₹2400 $= \frac{2400 - 2000}{2400} \times 100$

$$= \frac{400}{2400} \times 100 = \frac{100}{6} = 16\frac{2}{3}\% \text{ or } 16.66\%$$

The percent by which ₹2400 is more than ₹2000 $= \frac{2400 - 2000}{2000} \times 100$

$$= \frac{400}{2000} \times 100$$

$$= 20\%$$

Therefore the given percent are not same

EXERCISE 7.2

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 ₹ 1450 and two shirts marked at ₹ 850 each?**

Sol: MP of a jean=1450, MP of a shirt=₹850

Total MP of pair of jeans and two shirts= $1450 + 2 \times 850 = 1450 + 1700 = ₹3150$

MP=₹3150

Discount percent=10%

Discount =10% of 3150

$$= \frac{10}{100} \times 3150 = ₹315$$

$$SP = MP - \text{Discount} = 3150 - 315 = 2835$$

The customer will have to pay ₹2835

(OR)

$$MP=1450+2 \times 850=1450+1700=₹3150$$

Discount percent=10%

If MP is ₹100 then SP is ₹90

$$\text{When MP is ₹3150 then SP} = \frac{90}{100} \times 3150 = 9 \times 315 = ₹2835$$

2. **The price of a TV is ₹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.**

Sol: The price of a TV is ₹ 13,000

Sales tax percentage=12%

Tax amount=12% of 13000

$$= \frac{12}{100} \times 13000 = 12 \times 130 = ₹1560$$

Bill amount=Price of TV+ tax amount

$$=13000+1560=₹14560$$

Vinod will have to pay 14560 if he buys it

(OR)

The price of a TV is ₹ 13,000

Sales tax percentage=12%

If price is ₹100 then bill amount is ₹112

$$\text{When price is ₹13000 then bill amount} = \frac{112}{100} \times 13000$$

$$= 112 \times 130 = ₹14560$$

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

Sol: SP of a pair of skates = ₹1600

Discount percent=20%

If SP is ₹80 then MP is ₹100

$$\text{When SP is ₹1600 then MP} = \frac{100}{80} \times 1600 = 100 \times 20 = ₹2000$$

Marked price=₹2000

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

Sol: Amount paid=₹5,400

VAT percent=8%

If bill amount is ₹108 then the price before VAT is ₹100

$$\begin{aligned} \text{When amount paid is ₹5400 then the price before VAT} &= \frac{100}{108} \times 5400 \\ &= 100 \times 50 = ₹5000 \end{aligned}$$

The original price of hair dryer=₹5000

5. **An article was purchased for ₹1239 including GST of 18%. Find the price of the article before GST was added?**

Sol: Purchased amount of article=₹1239

GST percent=18%

If GST added amount is ₹ 118 then the before GST is ₹100

When GST added amount is ₹1239 then

$$\text{The price of article before GST} = \frac{100}{118} \times 1239 = \frac{50}{59} \times 1239 = 50 \times 21 = ₹1050$$

Original price=₹1050

Compound Interest

- (i) Interest is the extra money paid by institutions like banks or post offices on money deposited

(kept) with them. Interest is also paid by people when they borrow money

(ii) The interest is calculated on the amount of the previous year. This is known as interest compounded or Compound Interest (C.I.)

(iii) Amount when interest is compounded annually

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

A=amount, P = principal, R = rate of interest, n = time period (number of years)

(iv) Amount when interest is compounded half yearly

$$A = P \left(1 + \frac{R}{200} \right)^{2n}$$

(v) Amount when interest is compounded quarterly

$$A = P \left(1 + \frac{R}{400} \right)^{4n}$$

Example 8: Find CI on ₹ 12600 for 2 years at 10% per annum compounded annually.

Sol: Principal (P) = ₹ 12600, Rate (R) = 10, Number of years (n) = 2

$$\begin{aligned} A &= P \left(1 + \frac{R}{100} \right)^n \\ &= 12600 \left(1 + \frac{10}{100} \right)^2 \\ &= 12600 \left(1 + \frac{1}{10} \right)^2 \\ &= 12600 \left(\frac{11}{10} \right)^2 \\ &= 12600 \times \frac{11}{10} \times \frac{11}{10} = 126 \times 121 = ₹15246 \\ \text{CI} &= A - P = ₹15246 - ₹12600 = ₹ 2646 \end{aligned}$$

TRY THESE

1. Find CI on a sum of ₹ 8000 for 2 years at 5% per annum compounded annually.

Sol: Principal (P) = ₹8000

Rate of interest(R) =5

Time period (n) =2

$$\begin{aligned} A &= P \left(1 + \frac{R}{100} \right)^n \\ &= 8000 \left(1 + \frac{5}{100} \right)^2 \\ &= 8000 \left(1 + \frac{1}{20} \right)^2 \end{aligned}$$

$$\begin{aligned}
 &= 8000 \left(\frac{21}{20}\right)^2 \\
 &= 8000 \times \frac{21}{20} \times \frac{21}{20} \\
 &= 20 \times 21 \times 21 = ₹8820 \\
 CI &= A - P = ₹8820 - ₹8000 = ₹820
 \end{aligned}$$

Applications of Compound Interest Formula

- (i) Increase (or decrease) in population.
- (ii) The growth of a bacteria if the rate of growth is known.
- (iii) The value of an item, if its price increases or decreases in the intermediate years.

Example 9: The population of a city was 20,000 in the year 1997. It increased at the rate of 5% p.a. Find the population at the end of the year 2000.

Sol: Population (P) = 20,000

Rate of increase (R) = 5%

Time (n) = 2 years

$$\begin{aligned}
 \text{Population after 3 years} &= P \left(1 + \frac{R}{100}\right)^n \\
 &= 20000 \left(1 + \frac{5}{100}\right)^3 \\
 &= 20000 \left(1 + \frac{1}{20}\right)^3 = 20000 \times \frac{21}{20} \times \frac{21}{20} \times \frac{21}{20} = 23152.5
 \end{aligned}$$

The population at the end of the year 2000 = 23153

Example 10: A TV was bought at a price of ₹ 21,000. After one year the value of the TV was depreciated by 5% (Depreciation means reduction of value due to use and age of the item). Find the value of the TV after one year.

Sol: Price of TV (P) = ₹ 21,000

Depreciate = 5% i.e. R = -5%

Time period (n) = 1

$$\begin{aligned}
 \text{Value of the TV at the end of 1 year} &= 21000 \left(1 - \frac{5}{100}\right) = 21000 \times \frac{95}{100} \\
 &= 210 \times 95 = ₹19,950
 \end{aligned}$$

TRY THESE

1. A machinery worth ₹ 10,500 depreciated by 5%. Find its value after one year.

Sol: Principal = ₹ 10500

Reduction for one year = 5% of 10500

$$= \frac{5}{100} \times 10500 = 5 \times 105 = ₹525$$

Value after one year = $10500 - 525 = ₹9975$

(OR)

Principal(P) = ₹10500

Reduction = 5%

Period (n) = 1

$$\begin{aligned} \text{Value after one year} &= P \left(1 - \frac{R}{100}\right)^n \\ &= 10500 \left(1 - \frac{5}{100}\right)^1 \\ &= 10500 \times \frac{95}{100} = 105 \times 95 = ₹9975 \end{aligned}$$

2. Find the population of a city after 2 years, which is at present 12 lakh, if the rate of increase is 4%.

Sol: Present population (P) = 12,00,000

Rate of increase(R) = 4%

Period (n) = 2

$$\begin{aligned} A &= P \left(1 + \frac{R}{100}\right)^n \\ &= 12,00,000 \left(1 + \frac{4}{100}\right)^2 \\ &= 12,00,000 \left(\frac{104}{100}\right)^2 \\ &= 12,00,000 \times \frac{104}{100} \times \frac{104}{100} \\ &= 120 \times 104 \times 104 = 12,97,920 \end{aligned}$$

The population after 2 years = 12,97,920

EXERCISE 7.3

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?

Sol: (i) Population (A) = 54,000

Increased rate(R) = 5%

n = 2

$$\begin{aligned} A &= P \left(1 + \frac{R}{100}\right)^n \\ 54,000 &= P \left(1 + \frac{5}{100}\right)^2 \\ 54,000 &= P \left(1 + \frac{5}{100}\right)^2 \end{aligned}$$

$$54,000 = P \left(1 + \frac{1}{20}\right)^2$$

$$54,000 = P \left(\frac{21}{20}\right)^2$$

$$P = 54000 \times \frac{20}{21} \times \frac{20}{21} = 48979.6$$

The population in 2001=48980

(ii) Population (P) =54,000

Increased rate(R)=5%

n=2 (Population after 2 years)

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

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

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

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

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

$$= 135 \times 441 = 59535$$

The population in 2005 = 59535.

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.**

Sol: Initially count of bacteria (P)=5,06,000

Increasing rate per hour(R) = 2.5% = $\frac{25}{100}$ %

n=2

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

$$= 506000 \left(1 + \frac{25}{100}\right)^2$$

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

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

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

$$\begin{aligned} &= 506000 \times \frac{41}{40} \times \frac{41}{40} \\ &= \frac{1265 \times 1681}{4} = 531616.25 \end{aligned}$$

The bacteria at the end of 2 hours=531616

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

Sol: Cost price of scooter (P)=42,000

Rate of depreciation=8% $\therefore R=-8%$, n=1

$$\begin{aligned} A &= P \left(1 + \frac{R}{100}\right)^n \\ &= 42,000 \times \left(1 - \frac{8}{100}\right)^1 \\ &= 42000 \left(1 - \frac{2}{25}\right) \\ &= 42000 \times \frac{23}{25} \\ &= 1680 \times 23 = 38640 \end{aligned}$$

The value of the scooter after 1 year=38640

Please download NCERT -VI to X class all maths
notes from website

<https://sureshmathsmaterial.com/>

