

#463124

Find the ratio of the following.

- (a) Speed of a cycle 15km per hour to the speed of scooter 30 km per hour.
 (b) 5 m to 10 km
 (c) 50 paise to Rs. 5

Solution

In this question, first we will have to check whether the elements involved in the required ratio has the same units.

a)

Speeds of scooter and cycle, both have units "km per hour".

$$\text{Hence, Ratio} = \frac{\text{Speed of cycle}}{\text{Speed of scooter}} = \frac{15\text{km per hr}}{30\text{km per hr}} = \frac{1}{2}$$

b)

5m and 10 km.

We know,

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

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

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

c)

50 paise and Rs. 5

We know,

$$\text{Re. } 1 = 100\text{paise}$$

$$\therefore \text{Rs. } 5 = 500\text{paise}$$

$$\text{Ratio} = \frac{50\text{ paise}}{\text{Rs. } 5} = \frac{50}{500} = \frac{1}{10}$$

#463125

Convert the following ratios to percentages.

- (a) 3 : 4
 (b) 2 : 3

Solution

Converting a ration into percentage means making the denominator of the fraction = 100.

$$\text{a) } 3 : 4 = \frac{3}{4} = \frac{3 \times 25}{4 \times 25} = \frac{75}{100} = 75\%$$

$$\text{b) } 2 : 3 = \frac{2}{3} = \frac{2 \times 100}{3 \times 100} = \frac{200}{3 \times 100} = \frac{66.66}{100} = 66.66\%$$

#463127

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

Solution

72% of 25 students are good in Mathematics.

$$\therefore \text{No. of students good in Maths} = \frac{72}{100} \times 25 = 18\text{students}$$

$$\therefore \text{No. of students not good in Maths} = 25 - 18 = 7$$

#463128

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?

Solution

Let the total number of matches played by the football team be x .

No. of matches won = 10

$$\therefore \text{Win percent} = \frac{\text{No. of matches won}}{\text{Total no. of matches played}}$$

$$\therefore 40\% = \frac{10}{x}$$

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

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

The football team played a total of 25 matches.

#463129

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

Solution

Let Chameli have Rs. x in the beginning.

She spent 75% of the money that means she has only 25% left with her.

\therefore she is left with 25% of Rs. x which is equal to Rs. 600.

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

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

So, Chameli had Rs. 2400 in the beginning.

#463131

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 5 lakh, find the exact number who like each type of game.

Solution

People liking cricket = 60%

People liking football = 30%

\therefore People liking other games = $(100 - 60 - 30)\% = 10\%$

Total number of people in city = 50, 00, 000

$$\therefore \text{No. of people liking cricket} = \frac{60}{100} \times 50, 00, 000 = 30, 00, 000$$

$$\therefore \text{No. of people liking football} = \frac{30}{100} \times 50, 00, 000 = 15, 00, 000$$

$$\therefore \text{No. of people liking other games} = \frac{10}{100} \times 50, 00, 000 = 5, 00, 000$$

#463132

A man got a 10% increase in his salary. If his new salary is Rs. 1, 54, 000, find his original salary.

Solution

Let the original salary of the man be Rs. x .

He gets a 10% increase in the salary.

$$\therefore \text{New salary} = x + \left(\frac{10}{100} \times x \right) = \frac{11}{10}x$$

$$\therefore 1,54,000 = \frac{11}{10}x$$

$$\therefore x = \frac{1,54,000 \times 10}{11} = 1,40,000$$

The original salary of the man is Rs. 1,40,000

#463133

On Sunday 845 people went to the Zoo. On Monday only 169 people went. What is the percent decrease in the people visiting the Zoo on Monday?

Solution

Difference of people visting the zoo on Sunday and Monday = $845 - 169 = 676$

$$\% \text{ decrease} = \frac{\text{Difference}}{\text{Original}} \times 100 = \frac{676}{845} \times 100 = 80\%$$

So, there is 80% decrease in the people visiting the zoo on Monday.

#463136

A shopkeeper buys 80 articles for Rs. 2,400 and sells them for a profit of 16%. Find the selling price of one article.

Solution

Cost price of 80 articles = Rs. 2400

Profit on 80 articles = 16%

$$\therefore \text{Profit (Rs.)} = \frac{16}{100} \times 2400 = 384$$

$$\begin{aligned} \text{Selling Price of 80 articles} &= \text{Cost Price} + \text{Profit} \\ &= 2400 + 384 \\ &= \text{Rs. } 2784 \end{aligned}$$

$$\therefore \text{Selling price of 1 article} = \frac{2784}{80} = 34.8$$

So, selling price of 1 article is Rs. 34.8.

#463137

The cost of an article was Rs. 15,500. Rs. 450 were spent on its repairs. If it is sold for a profit of 15%, find the selling price of the article.

Solution

Cost price of article = Rs. 15, 500

Cost of repair = Rs. 450

∴ Total cost of article = Rs. (15500 + 450) = Rs. 15, 950

Profit on selling article = 15%

∴ Profit (Rs.) = $\frac{15}{100} \times 15,950 = 2392.5$

Selling Price = Cost Price + Profit

∴ Selling Price = 15950 + 2392.5 = 18342.5

#463139

A VCR and TV were bought for *Rs.* 8, 000 each. The shopkeeper made a loss of 4% on the VCR and a profit of 8% on the TV. Find the gain or loss percent on the whole transaction.

Solution

Selling price of the TV = $8000 + \frac{8}{100} \times 8000 = \text{Rs } 8640$

Selling price of the VCR = $8000 - \frac{4}{100} \times 8000 = \text{Rs } 7680$

Total cost price = Rs 8000 + 8000 = Rs 16000

Total selling price = Rs 8640 + 7680 = Rs 16320

Total gain = Rs 320

Gain % = $\frac{320}{16000} \times 100 = 2\%$

#463140

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 one jeans marked at *Rs.* 1450 and two shirts marked at *Rs.* 850 each?

Solution

Discount on the jeans = 10% of Rs 1450 = $1450 \times \frac{10}{100} = \text{Rs } 145$

Costs of both the shirts = Rs 850 + 850 = 1700

Discount on the the two shirts = 10% of Rs 1700 = $1700 \times \frac{10}{100} = \text{Rs } 170$

Total discount = Rs 145 + 170 = Rs 315

Selling of the goods = (1450 + 1700) – 315 = Rs 3150 – 315 = Rs 2835

#463143

A milkman sold two of his buffaloes for *Rs.* 20, 000 each. On one he made a gain of 5% and on the other a loss of 10%. Find his overall gain or loss.

Solution

Sp of buffalo1 = Rs 20, 000

Gain = 5%

So, Cost price of buffalo1 = $\frac{100}{105} \times 20,000 = \text{Rs. } 19047.62$

SP of buffalo2 = Rs 20, 000

Loss = 10%

Cost price of buffalo2 = $\frac{100}{90} \times 20,000 = \text{Rs } 22,222.22$

Total Cost price = Rs 41269.84

Total selling price = Rs 40, 000

Loss = Rs 1269.84

#463144

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.

Solution

Price of the TV = *Rs* 13000

Sales tax = 12%

Sales tax to be paid = 12% of *Rs.* 13000 = *Rs* 1560

Amount Vinod has to pay for the TV = *Rs* 13000 + 1560 = *Rs* 14560

#463145

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.

Solution

Discount = 20%

Selling price of the skates = *Rs* 1600

Marked price = $\frac{100}{80} \times 1600 = \text{Rs } 2000$

Marked price = *Rs* 2000

#463150

Calculate the amount and compound interest on

(a) *Rs.* 10, 800 for 3 years at $12\frac{1}{2}\%$ per annum compounded annually.

(b) *Rs.* 18, 000 for $2\frac{1}{2}$ years at 10% per annum compounded annually.

(c) *Rs.* 62, 500 for $1\frac{1}{2}$ years at 8% per annum compounded half yearly.

(d) *Rs.* 8, 000 for 1 year at 9% per annum compounded half yearly.

(You could use the year by year calculating using SI formula to verify).

(e) *Rs.* 10, 000 for 1 year at 8% per annum compounded half yearly.

Solution

a)

$$\begin{aligned}
 A &= P \left(1 + \frac{r}{100} \right)^n \\
 &= 10800 \left(1 + \frac{12.5}{100} \right)^3 \\
 &= 10800(1.423) \\
 &= 15377.34
 \end{aligned}$$

$$A = Rs. 15377.34$$

$$CI = Rs. 4577.34$$

b)

$$\begin{aligned}
 A &= P \left(1 + \frac{r}{100} \right)^n \times \left(1 + \frac{br}{100} \right) \\
 &= 18000 \left(1 + \frac{10}{100} \right)^2 \times \left(1 + \frac{0.5 \times 10}{100} \right) \\
 &= 18000(1.21)(1.05) \\
 &= 22843.06
 \end{aligned}$$

$$A = Rs. 22843.06$$

$$CI = A - P = Rs. 4843.06$$

c)

$$\begin{aligned}
 A &= P \left(1 + \frac{r}{200} \right)^{2n} \times \left(1 + \frac{br}{100} \right) \\
 &= 62500 \left(1 + \frac{8}{200} \right)^{2(1)} \times \left(1 + \frac{0.5 \times 8}{100} \right) \\
 &= 62500(1.0816)(1.04) \\
 &= 70304
 \end{aligned}$$

$$A = Rs. 70304$$

$$CI = A - P = Rs. 7804$$

d)

$$\begin{aligned}
 A &= P \left(1 + \frac{r}{200} \right)^{2n} \\
 &= 8000 \left(1 + \frac{9}{200} \right)^{2(1)} \\
 &= 8000(1.092) \\
 &= 8736.2
 \end{aligned}$$

$$A = Rs. 8736.20$$

$$CI = A - P = Rs. 736.20$$

e)

$$\begin{aligned}
 A &= P \left(1 + \frac{r}{200} \right)^{2n} \\
 &= 10000 \left(1 + \frac{8}{200} \right)^{2(1)} \\
 &= 10000(1.0816) \\
 &= 10816
 \end{aligned}$$

$$A = Rs. 10816$$

$$CI = A - P = Rs. 816$$

#463152

Kamala borrowed Rs. 26, 400 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).

Solution

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

$$= 26400 \left(1 + \frac{15}{100} \right)^{(2)}$$

$$= 26400(1.3225) = 34914$$

Simple interest for the remaining 4 months

$$= \frac{26400 \times 15 \times 4}{100 \times 12} = 1320$$

So, total repayment amount = Rs 34914 + 1320 = Rs 36234

#463153

Fabina borrows Rs. 12, 500 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 more interest and by how much?

Solution

Fabina:

$$SI = \frac{12500 \times 3 \times 12}{100} = 4500$$

Simple interest, SI = Rs 4500

Radha:

$$A = p \left(1 + \frac{r}{100} \right)^n = 12500 \left(1 + \frac{10}{100} \right)^{(3)} = 12500(1.331) = 16637.5$$

Amount = Rs 16637.50

$$CI = A - P = \text{Rs } 16637.5 - 12500 = \text{Rs } 4137.5$$

Fabina pays more interest by Rs 362.50

#463154

I borrowed Rs. 12, 000 from Jamshed at 6% per annum simple interest for 2 years. If I borrowed this sum at 6% per annum compound interest, what extra amount would I have to pay?

Solution

$$SI = \frac{12000 \times 6 \times 2}{100} = 1440$$

$$A = SI + P = 1440 + 12000 = \text{Rs. } 13440$$

Compound interest:

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

$$= 12000 \left(1 + \frac{6}{100} \right)^{(2)}$$

$$= 12000(1.1236)$$

$$= 13483.2$$

Amount = Rs. 13483.20

$$CI = A - P = \text{Rs. } 13483.20 - 12000 = \text{Rs. } 1483.20$$

Extra interest = Rs. 43.20

#463155

Vasudevan invested *Rs.* 60, 000 at an interest rate of 12% per annum compounded half yearly. What amount would he get

(i) after 6 months?

(ii) after 1 year?

Solution

i)

$$\begin{aligned} A &= P \left(1 + \frac{r}{200} \right)^{2n} \\ &= 60000 \left(1 + \frac{12}{200} \right)^{\left(2 \times \frac{1}{2} \right)} \\ &= 60000 (1.06) \\ &= 63600 \end{aligned}$$

Amount after 6 months = *Rs.* 63, 600

ii)

$$\begin{aligned} A &= P \left(1 + \frac{r}{200} \right)^{2n} \\ &= 60000 \left(1 + \frac{12}{200} \right)^{(2 \times 1)} \\ &= 60000 (1.1236) \\ &= 67416 \end{aligned}$$

Amount after 1 year = *Rs.* 67, 416

#463157

Arif took a loan of *Rs.* 80, 000 from a bank. If the rate of interest is 10% per annum, find the difference in amounts he would be paying after $1\frac{1}{2}$ years if the interest is

(i) compounded annually.

(ii) compounded half yearly.

Solution

i)

$$\begin{aligned} A &= P \left(1 + \frac{r}{100} \right)^n \times \left(1 + \frac{br}{100} \right) \\ &= 80000 \left(1 + \frac{10}{100} \right)^{(1)} \times \left(1 + \frac{0.5 \times 10}{100} \right) \\ &= 80000 (1.1) (1.05) \\ &= 92400 \end{aligned}$$

Amount = *Rs.* 92, 400

ii)

$$\begin{aligned} A &= P \left(1 + \frac{r}{200} \right)^{2n} \times \left(1 + \frac{br}{100} \right) \\ &= 80000 \left(1 + \frac{10}{200} \right)^{(2 \times 1)} \times \left(1 + \frac{0.5 \times 10}{100} \right) \\ &= 80000 (1.1025) (1.05) \\ &= 92610 \end{aligned}$$

Amount = *Rs.* 92, 610

Difference = *Rs.* 210

#463158

Maria invested *Rs.* 8, 000 in a business. She would be paid interest at 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.

Solution

$$\begin{aligned} \text{i) } A &= P \left(1 + \frac{r}{100} \right)^n \\ &= 8000 \left(1 + \frac{5}{100} \right)^{(2)} \\ &= 8000 (1.1025) \\ &= 8820 \end{aligned}$$

Amount at the end of 2 years = *Rs.* 8, 820

$$\begin{aligned} \text{ii) } A &= p \left(1 + \frac{r}{100} \right)^n \\ &= 8000 \left(1 + \frac{5}{100} \right)^{(3)} \\ &= 8000 (1.157625) \\ &= 9261 \end{aligned}$$

Amount at the end of 3 years = *Rs.* 9261

So, the interest for 3rd year = *Rs.* 9261 – 8820 = *Rs.* 441

#463160

Find the amount and the compound interest on *Rs.* 10, 000 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?

Solution

Compounded half yearly:

$$\begin{aligned} A &= P \left(1 + \frac{r}{200} \right)^{2n} \times \left(1 + \frac{br}{100} \right) \\ &= 10000 \left(1 + \frac{10}{200} \right)^{(2)} \times \left(1 + \frac{\frac{1}{2} \times 10}{100} \right) \\ &= 10000(1.1025)(1.05) \\ &= 11576.25 \end{aligned}$$

Amount = *Rs.* 11, 576.25

CI = *A* – *P* = *Rs.* 1576.25

#463162

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

Solution

$$\begin{aligned} A &= p \left(1 + \frac{r}{200} \right)^{2n} \times \left(1 + \frac{br}{100} \right) \\ &= 4906 \left(1 + \frac{12.5}{200} \right)^{(2 \times 1)} \times \left(1 + \frac{\frac{1}{2} \times 12.5}{100} \right) \\ &= 4906(1.12890625)(1.0625) \\ &= 5884.56 \end{aligned}$$

Amount = *Rs.* 5884.56

#463165

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?

Solution

i)

New population = 54,000

Time (n) = 2 yrs

$r = 5\%$

Original population = ?

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

$$54000 = \frac{P}{0.9025}$$

$$P = 48735$$

Population in 2001 was 48,735.

ii)

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

$$= 54000(1.1025) = 59,535$$

Population in 2005 will be 59,535.

#463168

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.

Solution

Initial no. of bacteria = 506,000

Rate = 2.5%

Time = 2 hours

New population of bacteria = ?

$$A = 506,000 \left(1 + \frac{2.5}{100}\right)^2$$

$$= 506000(1.050625)$$

$$= 531616.25$$

Amount of bacteria after 2 hours = 531,616.

#463169

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

Solution

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

$$= 42000(0.92)$$

$$= 38640$$

Value of the scooter after 1 year is Rs. 38,640.

#463750

A photograph of a bacteria enlarged 50,000 times attains a length of 5 cm. What is the actual length of the bacteria? If the photograph is enlarged 20,000 times only, what would be its enlarged length?

Solution

We have, Actual length of bacteria \times enlargement constant = length in diagram

$$\text{So, actual length} = \frac{5}{50000} \text{ cm} = \frac{1}{10000} \text{ cm}$$

Now, the enlargement constant changes to 20000.

$$\text{Then, enlarged length of bacteria} = \frac{20000 \times 1}{10000} = 2$$

So, enlarged length of bacteria is 2 cm

#463755

A loaded truck travels 14 km in 25 minutes. If the speed remains the same, how far can it travel in 5 hours?

Solution

Given, $x_1 = 14$, $y_1 = 25$ min, $y_2 = 5$ hours = 300 min

$$\frac{x_1}{y_1} = \frac{x_2}{y_2}$$

$$\Rightarrow \frac{14}{25} = \frac{x_2}{300}$$

$$\Rightarrow x_2 = 168 \text{ kms}$$

#463761

A contractor estimates that 3 persons could rewire Jasminers house in 4 days. If he uses 4 persons instead of three, how long should they take to complete the job?

Solution

According to the estimation in rewiring Jasminers house

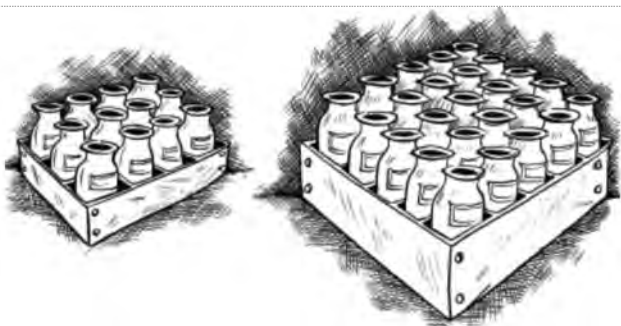
Number of persons required = 3

Number of days required = 4

So, to rewire a house by 1 person it will take $4 \times 3 = 12$ days

And to do job by 4 persons, days required = $\frac{12}{4} = 3$ days

#463762



A batch of bottles were packed in 25 boxes with 12 bottles in each box. If the same batch is packed using 20 bottles in each box, how many boxes would be filled?

Solution

If 12 bottles each can be packed in 25 boxes, then

$$\text{Number of boxes required to pack 20 bottles in each box are } \frac{25 \times 12}{20} = 15$$

#463763

A factory requires 42 machines to produce a given number of articles in 63 days. How many machines would be required to produce the same number of articles in 54 days?

Solution

63 days required to produce articles using 42 machines.

No. of machines required to produce same number of articles in 54 days

$$= \frac{42 \times 63}{54} = 49$$

Therefore, 49 machines would be required to produce the articles in 54 days.

#463764

A car takes 2 hours to reach a destination by travelling at the speed of 60 km/h. How long will it take when the car travels at the speed of 80 km/h?

Solution

Time taken by car to reach destination at $60 \text{ km/hr} = 2$ hours

We know, Distance = Speed x Time

\therefore Distance travelled = $60 \times 2 = 120 \text{ km}$.

\therefore Time taken by car to reach destination at $80 \text{ km/hr} = \frac{120}{80} = 1.5$ hours

#463766

A school has 8 periods a day each of 45 minutes duration. How long would each period be, if the school has 9 periods a day, assuming the number of school hours to be the same?

Solution

1 period = 45 minutes

\therefore 8 periods = $45 \times 8 = 360$ minutes

\therefore Total school hours (in min) = 360

If there are 9 periods in a day and the school hours remain same,

Then, 1 period = $\frac{360}{9} = 40$ minutes