

MATHEMATIC

Chapter 8: Comparing Quantities



Important Questions

Multiple Choice Questions-

Question 1. A shopkeeper purchased 300 bulbs for Rs 10 each. However 10 bulbs were fused and had to be thrown away. The remaining were sold at Rs 12 each. Find the gain or loss %.

- (a) 15%
- (b) 13%
- (c) 16%
- (d) none of these

Question 2. Find the ratio of 5 m to 10 km.

- (a) It is 1:3
- (b) It is 3000:1
- (c) It is 2000:1
- (d) It is 1:2000

Question 3. Rohan bought a second hand refrigerator for Rs 2,500, then spent Rs 500 on its repairs and sold it for Rs 3,300. Find his loss or gain per cent.

- (a) Loss 15%
- (b) Loss 10%
- (c) Profit 10%
- (d) None of these

Question 4. The sale price of a shirt is Rs.176. If a discount of 20% is allowed on its marked price, what is the marked price of the shirt?

- (a) Rs.160
- (b) Rs.180
- (c) Rs. 200
- (d) Rs. 220

Question 5. Find selling price (SP) if a profit of 5% is made on a cycle of Rs 700 with Rs 50 as overhead charges.

- (a) Rs 600
- (b) Rs 787.50
- (c) Rs 780
- (d) None of these

Question 6. Sohan bought a washing machine for Rs 40,000, then spent Rs 5,000 on its repairs and sold it for Rs 50,000. Find his loss or gain per cent.

- (a) Loss 10%
- (b) Loss 20%
- (c) Profit 11%
- (d) none of these

Question 7. Find the ratio of speed of a cycle 20 km per hour to the speed of scooter 30 km per hour.

- (a) It is 3:1
- (b) It is 2:1
- (c) It is 2:3
- (d) It is 1:3

Question 8. A shopkeeper purchased 500 pieces for Rs 20 each. However 50 pieces were spoiled in the way and had to be thrown away. The remaining were sold at Rs 25 each. Find the gain or loss %.

- (a) 18%
- (b) 15%
- (c) 12.5%
- (d) none of these

Question 9. A picnic is being planned in a school. Girls are 60% of the total number of students and are 300 in number. Find the ratio of the number of girls to the number of boys in the class.

- (a) It is 3:2
- (b) It is 3:1
- (c) It is 2:3
- (d) It is 2:1

Question 10. An item marked at Rs 840 is sold for Rs 714. What is the discount %?

- (a) 20%
- (b) 10%
- (c) 15%
- (d) none of these

Very Short Questions:

1. Express the following in decimal form:
 - (a) 12%
 - (b) 25%
2. Evaluate the following:

- (a) 20% of 400
- (b) $12\frac{1}{2}\%$ of 625
3. If 20% of x is 25, then find x .
4. Express the following as a fraction
- (a) 35%
- (b) 64%
5. Express the following into per cent
- (a) $1\frac{3}{5}$
- (b) 2 : 5
6. There are 24% of boys in a school. If the number of girls is 456, find the total number of students in the school.
7. The cost of 15 articles is equal to the selling price of 12 articles. Find the profit per cent.
8. An article is marked at ₹ 940. If it is sold for ₹ 799, then find the discount per cent.

Short Questions :

1. A watch was bought for ₹ 2,700 including 8% VAT. Find its price before the VAT was added.
2. Find the amount if ₹ 2,000 is invested for 2 years at 4% p.a. compounded annually.
3. A number is increased by 20% and then it is decreased by 20%. Find the net increase or decrease per cent.
4. Two candidates Raman and Rajan contested an election. Raman gets 46% of the valid votes and is defeated by 1600 votes. Find the total number of valid votes cast in the election.
5. A man whose income is ₹ 57,600 a year spends ₹ 43,200 a year. What percentage of his income does he save?
6. A CD player was purchased for ₹ 3,200 and ₹ 560 were spent on its repairs. It was then sold at a gain of $12\frac{1}{2}\%$ How much did the seller receive?
7. A car is marked at ₹ 3,00,000. The dealer allows successive discounts of 6%, 4% and $2\frac{1}{2}\%$ on it. What is the net selling price of it?
8. Ramesh bought a shirt for ₹ 336, including 12% ST and a tie for ₹ 110 including 10% ST. Find the list price (without sales tax) of the shirt and the tie together.

Long Questions :

1. Find the amount of ₹ 6,250 at 8% pa compounded annually for 2 years. Also, find the compound interest.

2. Find the compound interest on ₹ 31,250 at 12% pa for $12\frac{1}{2}$ years.
3. Vishakha offers a discount of 20% on all the items at her shop and still makes a profit of 12%. What is the cost price of an article marked at ₹ 280?
4. Find the compound interest on ₹ 48,000 for one year at 8% per annum when compounded half yearly.
5. **Sahana sells two watches for Rs. 1955 each gaining 15% on one and losing 15% on the other. Find her gain or loss percent in the whole transaction.**

Answer Key-

Multiple Choice questions-

1. (c) 16%
2. (d) It is 1:2000
3. (c) Profit 10%
4. (d) Rs. 220
5. (b) Rs 787.50
6. (c) Profit 11%
7. (c) It is 2:3
8. (c) 12.5%
9. (a) It is 3:2
10. (c) 15%

Very Short Answer :

1. (a) $12\% = \frac{12}{100} = 0.12$
 (b) $25\% = \frac{25}{100} = 0.25$

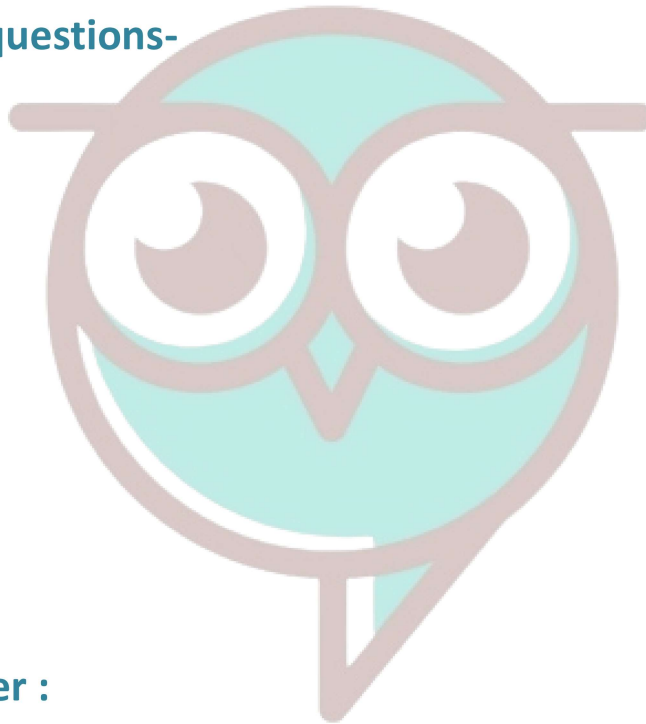
2.

$$(a) 20\% \text{ of } 400 = \frac{20}{100} \times 400 = 80$$

$$(b) 12\frac{1}{2}\% \text{ of } 625 = \frac{25}{2}\% \text{ of } 625$$

$$= \frac{25}{2 \times 100} \times 625 = \frac{625}{8} = 78\frac{1}{8}$$

3.



Swotters

$$\Rightarrow \frac{20}{100} \times x = 25$$

$$\therefore x = 25 \times \frac{100}{20} = 125$$

Hence $x = 125$

4.

$$(a) 35\% = \frac{35}{100} = \frac{7}{20}$$

$$(b) 64\% = \frac{64}{100} = \frac{16}{25}$$

5.

$$(a) 1\frac{3}{5} = \frac{8}{5} = \frac{8}{5} \times 100 = 160\%$$

$$(b) 2:5 = \frac{2}{5} = \frac{2}{5} \times 100 = 40\%$$

6. Let the total number of students be 100.

$$\text{Number of boys} = 24\% \text{ of } 100 = \frac{24}{100} \times 100 = 24$$

$$\text{Number of girls} = 100 - 24 = 76$$

\Rightarrow If number of girls is 76, then total number of students = 100

\Rightarrow If Number of girls is 1, then total number of students = 10076

$$\text{If Number of girls is 456, then total number of students} = \frac{100 \times 456}{76} = 600$$

Hence, the total number of students in the school = 600

7.

$$\begin{aligned} \therefore \text{Profit on 1 article} &= ₹ \frac{100}{12} - ₹ \frac{100}{15} \\ &= ₹ \left(\frac{500 - 400}{60} \right) \\ &= ₹ \frac{100}{60} \end{aligned}$$

$$\therefore \text{Profit per cent} = \frac{\text{Profit}}{\text{CP}} \times 100$$

$$\begin{aligned} &= \frac{\frac{100}{60}}{\frac{100}{15}} \times 100 \\ &= \frac{100}{60} \times \frac{15}{100} \times 100 \end{aligned}$$

8. Hence, profit = 25%

$$MP = ₹ 940$$

$$SP = ₹ 799$$

$$\text{Discount} = MP - SP = 940 - 799 = ₹ 141$$

$$\begin{aligned} \therefore \text{Discount per cent} &= \frac{\text{Discount}}{MP} \times 100 \\ &= \frac{141}{940} \times 100 = 15\% \end{aligned}$$

Hence, discount = 15%

Short Answer :

1. Cost of watch including VAT = ₹ 2,700

Let the initial cost of the watch be ₹ 100

$$\text{VAT} = 8\% \text{ of } ₹ 100 = ₹ 8$$

$$\text{Cost of watch including VAT} = ₹ 100 + ₹ 8 = ₹ 108$$

If cost including VAT is ₹ 108, then its initial cost = ₹ 100

$$\text{If cost including VAT is } ₹ 1, \text{ then its initial cost} = ₹ \frac{100}{108}$$

$$\text{If cost including VAT is } ₹ 2,700, \text{ then its initial cost} = ₹ \frac{100}{108} \times 2700 = ₹ 2500$$

Hence, the required cost = ₹ 2,500

2.

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

$$= 2000 \left(1 + \frac{4}{100} \right)^2$$

$$= 2000 \times \left(\frac{26}{25} \right)^2$$

$$= 2000 \times \frac{26 \times 26}{25 \times 25}$$

$$= \frac{16 \times 676}{5} = ₹ \frac{10,816}{5}$$

$$= ₹ 2,163.20$$

Hence, the required amount = ₹ 2,163.20

3. Let the number be 100

$$20\% \text{ increase} = \frac{20}{100} \times 100 = 20$$

$$\text{Increased value} = 100 + 20 = 120$$

Now it is decreased by 20%

$$\text{Decreased value} = 120 - \frac{120}{100} \times 20 = 120 - 24 = 96$$

$$\text{Net decrease} = 100 - 96 = 4$$

$$\text{Decrease per cent} = \frac{4}{100} \times 100 = 4\%$$

Hence, the net decrease per cent = 4%

4. Let the total number of valid votes be 100

$$\text{Number of votes got by Raman} = 46\% \text{ of } 100 = \frac{46}{100} \times 100 = 46$$

$$\text{Number of votes got by Rajan} = 100 - 46 = 54$$

$$\text{Difference between the votes} = 54 - 46 = 8$$

$$8\% \text{ of Valid votes} = 1,600$$

$$\Rightarrow \frac{8}{100} \times \text{Valid votes} = 1,600$$

$$\Rightarrow \text{Valid votes} = \frac{1600 \times 100}{8} = 20,000$$

Hence, the total number of valid votes = 20,000

5. Annual income of a man = ₹ 57,600

$$\text{Amount spent by him in the year} = ₹ 43,200$$

$$\text{Net amount saved by him} = ₹ 57,600 - ₹ 43,200 = ₹ 14,400$$

$$\text{Percentage of his annual saving} = \frac{\text{Saving}}{\text{Income}} \times 100$$

$$= \frac{14400}{57600} \times 100$$

$$= 25\%$$

Hence, the saving percentage = 25%

6. Cost price of the CD player = ₹ 3,200

$$\text{Amount spent on its repairing} = ₹ 560$$

$$\text{Net cost price} = ₹ 3,200 + ₹ 560 = ₹ 3,760$$

$$\begin{aligned}
 SP &= CP \left(1 + \frac{\text{gain}}{100} \right) \\
 &= 3,760 \left(1 + \frac{25}{2 \times 100} \right) \\
 &= \overset{470}{\cancel{3,760}} \times \frac{9}{8} \\
 &= 470 \times 9 = ₹ 4,230
 \end{aligned}$$

Hence, the required amount = ₹ 4,230

7. Marked price of the car = ₹ 3,00,000

Net selling price after the successive discounts

$$\begin{aligned}
 &= 3,00,000 \times \left(\frac{100-6}{100} \right) \\
 &\quad \times \left(\frac{100-4}{100} \right) \times \left(\frac{100-2.5}{100} \right) \\
 &= 3,00,000 \times \frac{94}{100} \times \frac{96}{100} \times \frac{97.5}{100} \\
 &= \frac{3 \times 94 \times 96 \times 97.5}{10} = ₹ 2,63,952
 \end{aligned}$$

Hence, the net selling price = ₹ 2,63,952

8. List price of the shirt = $\frac{110}{112} \times 336 = ₹ 300$

$$\text{List price of the tie} = \frac{100}{110} \times 110 = ₹ 100$$

List price of both together = ₹ 300 + ₹ 100 = ₹ 400

Long Answer :

1.

$$\begin{aligned}
 A &= P \left(1 + \frac{R}{100} \right)^n \\
 &= 6,250 \left(1 + \frac{8}{100} \right)^2 \\
 &= 6,250 \left(\frac{27}{25} \right)^2 \\
 &= 6,250 \times \frac{27}{25} \times \frac{27}{25} = ₹ 7,290
 \end{aligned}$$

$$\begin{aligned}
 \therefore CI &= A - P \\
 &= ₹ 7290 - ₹ 6,250 = ₹ 1,040
 \end{aligned}$$

Hence, amount = ₹ 7,240 and CI = ₹ 1,040

2.

$$\begin{aligned}
 A &= 31,250 \left(1 + \frac{12}{100}\right)^2 \left(1 + \frac{12 \times \frac{1}{2}}{100}\right) \\
 &= 31,250 \times \frac{28}{25} \times \frac{28}{25} \times \frac{53}{50} \\
 &= 31,250 \times \frac{784}{625} \times \frac{53}{50} = ₹ 41,552 \\
 \text{CI} &= A - P \\
 &= ₹ 41,552 - ₹ 31,250 \\
 &= ₹ 10,302
 \end{aligned}$$

Hence, compound interest = ₹ 10,302

3. Marked Price = ₹ 280

Discount = 20% of ₹ 280

$$= \frac{1}{2} \times 280 = ₹ 56$$

So selling price = ₹ (280 - 56) = ₹ 224

Let the cost price be ₹ 100

Profit = 12% of ₹ 100 = ₹ 12

So selling price = ₹ (100 + 12) = ₹ 112

If the selling price is ₹ 112, cost price = ₹ 100

If the selling price is ₹ 224, cost price = ₹ $\left(\frac{100}{112} \times 224\right) = ₹ 200$

4. Principal (P) = ₹ 48,000

Rate (R) = 8% p.a.

Time (n) = 1 year

Interest is compounded half yearly

$$\begin{aligned}
 A &= P \left(1 + \frac{R}{200}\right)^{2n} \\
 &= 48,000 \left(1 + \frac{8}{200}\right)^2 \\
 &= 48,000 \times \frac{26}{25} \times \frac{26}{25} \\
 &= 76.8 \times 26 \times 26 \\
 &= ₹ 51,916.80
 \end{aligned}$$

Therefore Compound Interest = A - P = ₹ (51,916.80 - 48,000) = ₹ 3,916.80.

5.

CP = Rs. 1955. Gain = 15%

$$SP = 1955 \times \frac{115}{100} = \text{Rs. } 2248.25$$

CP = Rs. 1955

$$SP = 1955 \times \frac{85}{100} = \text{Rs. } 1661.75$$

$$CP = \text{Rs. } 1955 + \text{Rs. } 1955 = \text{Rs. } 3910$$

$$SP = \text{Rs. } 2248.25 + \text{Rs. } 1661.75 = 3910$$

$$CP > SP \text{ Loss of Rs. } (3990 - 3910) = \text{Rs. } 80 = 2\%$$

$$\text{Loss percent} = 2\%$$



Swotters