

COMPARING QUANTITIES

EXERCISE : 8.1

1. Find the ratio of the following:

- (a) 3 cm to 4 m (b) 9 g to 2 kg (c) 7 months to 1 year
(d) 11 minutes to 3 hours (e) 3.7 m to 6.5 m (f) ₹ 546: 50 p

2. Express the following ratios in the simplest form.

- (a) 169: 403 (b) 324: 144 (c) 45: 70 (d) 194: 12
(e) 144: 96 (f) 78: 100 (g) 144: 72 (h) 50: 20

3. Check whether the following ratios are equivalent or not.

- (a) 45 : 16 and 11 : 4 (b) 12 : 28 and 27 : 36 (c) 25 : 20 and 5 : 4
(d) 15: 16 and 7:8 (e) 16:36 and 4:9 (f) 15 : 27 and 32 : 40

4. Compare the following ratios.

- (a) 3 : 4 and 9 : 16 (b) 1 : 2 and 13 : 27 (c) 7 : 6 and 24 : 9
(d) 5 : 20 and 4 : 5 (e) 5:7 and 15:21 (f) 2 : 3 and 4 : 7

5. Find the value of x .

- (a) $x : 8 = 13 : 104$ (b) $8:12 = x : 9$ (c) $4: x = x : 9$
(d) $18 : 27 = 34 : x$ (e) $36 : X = 54 : 6$ (f) $X : 90 = 104 : 78$

6. Fill in the missing number.

- (a) $\frac{14}{21} = \frac{\quad}{3} = \frac{6}{\quad}$ (b) $\frac{12}{20} = \frac{\quad}{5} = \frac{9}{\quad}$ (c) $\frac{\quad}{8} = \frac{13}{104} = \frac{\quad}{16}$

7. If $(5x + 3) : (3x + 11) = 13 : 17$, find the value of x .

8. Two numbers are in the ratio of 4 : 5. If the sum of the numbers is 36, then find the numbers.

9. The ratio between two numbers is 3 : 4. If their LCM is 192, then find the numbers.

10. Two numbers are in the ratio of 5 : 7. If 3 is subtracted from each of them, the ratio becomes 2 : 3. Find the numbers.
11. Two numbers are in the ratio of 3 : 5. If 8 is added to each number, the ratio becomes 2 : 3. Find the numbers.
12. In the ratio 7 : 8, if the consequent is 40, find the antecedent.
13. Divide ₹ 351 into two parts such that the ratio of the two parts is 2 : 7 ?
14. Find the ratio of the price of pencil to that of pen, if pencils cost ₹ 16 per score and pens cost ₹ 8 .40 per dozen.
15. What is the size of each part 2004 acres of land have to be divided in the ratio 3 : 4 : 5?
16. Divide ₹ 1,638 between three people A, B and C such that A gets four-fifth of what B gets and the ratio of the share of B to C is 5 : 12.
17. If $l : m = 3 \frac{1}{2} : 3 \frac{3}{4}$ and $m : n = 1 \frac{1}{3} : 2 \frac{1}{5}$, then find (a) $l : n$ (b) $l : m : n$

EXERCISE : 8.2

1. Check whether the following numbers are in proportion or not.

- (a) 30, 120, 40, 42 (b) 36, 48, 18, 24 (c) 40, 48, 160, 192
 (d) 15, 25, 20, 30 (e) 72, 84, 186, 217 (f) 10, 60, 150, 25

2. Find the value of x for which the following numbers form a proportion.

- (a) $3 : 11 :: 13.5 : x$ (b) $400 : 150 :: x : 105$ (c) $6 : 34 :: 90 : x$
 (d) $x : 8 :: 8 : 16$ (e) $40 : 30 :: 60 : x$ (f) $x : 18 :: 14 : 21$

3. Find the value of x for which the following numbers are in continued proportion .

- (a) 25, 75, x (b) 22, 66, x (c) 19, 57, x (d) 16, 48, x

4. Find the fourth proportional to the given numbers.

(a) 14 , 16 , 21

(b) 4, 12, 2

(c) 9, 27, 3

(d) 8, 6, 12

5. Find the third proportional to the given numbers.

(a) 24 and 48

(b) 6 and 18

(c) 32 and 72

(d) 28 and 56

6. Find the mean proportion to 21 and 84.

7. The management ensures a pupil-teacher ratio of 20 : 1 in the primary school and 30 : 1 in the middle school. If 340 students were there in the primary school and 450 students in the middle school, find the ratio of the primary school teachers to the middle school teachers.

8. At a particular time, the shadow of a pole and tower are 25 m and 40 m, respectively. If the height of the tower is 45 m, find the height of the pole.

9. Find the mean proportion between 15 and 60.

10. Find the value of a , if 3, 9 and a are in continued proportion.

11. The first, the second and the fourth terms of a proportion are 32, 112 and 217, respectively. Find the third term.

12. Check whether 8, 12 and 18 are in continued proportion or not.

13. If $A : B = 3 : 4$ and $B : C = 6 : 7$, then find the ratio of $A : C$.

14. The ratio of the heights of A and B is 9 : 10. If the height of A is 144 cm, then find the height of B.

15. The ratio of the length and breadth of a rectangular field is 8 : 7. If the breadth of the field is 98 m, then find its length.

16. A map showed a scale of 1 : 1200000. Find the actual distance between the two buildings, if they are 12 cm apart on the map.

EXERCISE : 8.3

1. Observe the given proportion, identify as direct or inverse and hence find the value of x .

(a) $14:35 :: 16:x$ (b) $6:8 :: 8:x$ (c) $18:27 :: 34:x$

2. Complete the table given below where x and y vary directly.

(a)

x	4	7		17
y	20		35	

(b)

x	3		8	9	
y		15	20		27.5

3. Complete the table given below where x and y vary inversely.

(a)

x	15	13		4
y	52		156	

(b)

x	2	5		15
y		84	42	

4. A carpenter earns ₹1650 in 3 hours. How much will he earn in 9 hours?

5. An aeroplane flies 3200 km in 4 hours. How far does it travel in 7 hours?

6. 25 men dig a trench in 42 days. Find the number of days in which 30 men can dig the same trench.

7. The monthly expenditure of a hostel for 10 children is ₹8,000. Find the monthly expenditure of the hostel for 15 children.

- 8.** It takes 4 hours to go from Mumbai to Pune at an average speed of 60 km/h. How long will it take for a person to cover this distance at an average speed of 75 km/h?
- 9.** A ship has a provision for 500 passengers for 60 days. If 100 more passengers join the journey, for how many days will the provision last?
- 10.** If 2 packs, each containing 12 pieces cost ₹ 96, then find the cost of 2 packs of soap bars, each pack containing 3 pieces.
- 11.** If 2880 statues are packed in 32 boxes. Then find the number of statues packed in 18 boxes.
- 12.** If a car, that Ashwin owns, can go 150 km in 15 L of petrol, then how far can it go with 50 L of petrol?
- 13.** 27 girls complete an embroidery work in 10 days. How many days will 18 girls take to complete the same work?
- 14.** 12 rooms in a hotel could accommodate 4 students each who were on an educational tour. 16 more students joined the tour, how many more rooms would be required for the team?
- 15.** An exploration team of 36 people completed a task in 14 days. Find the number of people required to complete the work in half the number of days.
- 16.** Gauri takes 5 hours to paint a wall and Garima takes 6 hours to paint the same wall. How long will they take to paint the wall, if they work together? If Gambhir helps Gauri and Garima finish painting the wall and they all together take 3 hours to paint the same wall, find the time taken by Gambhir alone to paint the same wall.

EXERCISE : 8.4

1. Convert the following ratios into percentages.

- (a) 35: 16 (b) 4 : 5 (c) 11 : 16 (d) 18 : 25

2. Convert the following decimals into percentages.

- (a) 38.26 (b) 78.85 (c) 24.17 (d) 11.38

3. Convert the following fractions into percentages.

- (a) $\frac{14}{16}$ (b) $\frac{14}{125}$ (c) $\frac{42}{64}$ (d) $\frac{23}{40}$

4. Convert the following percentages in to decimals.

- (a) 38% (b) 33.33% (c) 45.78% (d) 76%

5. Convert the following percentages in to fractions and ratios.

- (a) 32 % (b) 18 % (c) 64 % (d) 45%

6. Find the value of:

- (a) 24% of 162 (b) 80% of 80 kg (c) 16% of 2242 cm (d) 5.4% of 25 minutes
(e) 1 % of 100 L (f) 8.5% of ₹ 1780

7. Find the increased/decreased value when:

- (a) Initial value = ₹ 850, percentage increase = 15%
(b) Initial value = ₹ 1990, percentage decrease = 20%
(c) Initial value = 556 L, percentage increase = 16.5%
(d) Initial value = 2800 g, percentage decrease = 22%
(e) Initial value = 5648 km. percentage increase = 1.7%

8. The population of a village increases by 5%. If the increased population of the town is 10080. Find its original population.

9. If my monthly savings is 22% of my income, then find my monthly expenditure on a monthly salary of ₹35000.

10. In an election, the candidate scoring 45% of votes lost by 120 votes. Find the total number of vote polled.

- 11.** Bharat has 24 pages to write. By evening, he had completed 25% of his work. How many page was he left with, to write at the end of the evening?
- 12.** Reema obtained 45 marks out of 80. Calculate her percentage.
- 13.** A box contains 60 apples, out of which $16\frac{3}{4}\%$ are rotten. Find the number of good apples.
- 14.** Mr Moti willed his property worth ₹ 2,50,000. He decided to divide it between his 3 sons in three portions - 30%, 45% and 25%. How much did each of them inherit?
- 15.** Out of an income of ₹ 15,000, Nairn spends ₹ 10,200. What per cent of her income does she save ?
- 16.** In a theatre, there are 2700 seats. Out of these, 35% of the seats are in the balcony, 30% of the seats in the rear stall and the rest in the front stall. If the tickets cost ₹ 60, ₹ 40 and ₹ 30 for balcony rear stall and front stall, respectively, find the total collection for a show when it is houseful?

EXERCISE : 8.5

2. Find SP, if profit % = 15 %, overhead expense = ₹ 450 and CP = ₹ 1850
3. Find CP, if loss % is 18 % and selling price is ₹ 287.
4. What is the selling price of the bag , if the cost price of a school bag is ₹ 620 and the seller earns a profit of 24 %?
5. A retailer purchased an article for ₹ 840 find his gain or loss percent.
6. Anu bought a scooter for ₹15,000 and sold it for ₹ 18 ,000. Find his gain %.

7. By selling a wall clock at a loss of 20 %, a shopkeeper incurs a loss of ₹ 80. Find its cost price and selling price .

Let CP = x

Loss = 20% of x

A/Q , 20% of x =80

$$\frac{20x}{100} = 80$$

$$X = 400$$

Therefore CP = ₹ 400 , SP = ₹ (400 – 80)= ₹ 320

8. Madhav bought a book for ₹2,000 and sold it for ₹ 1,800. Find his loss per cent.
9. By selling a transmitter for ₹ 864 , a shopkeeper gains 8%. Find his cost price.
10. By selling an induction stove for ₹1,035 , a shopkeeper gains 15 % . Find his cost price.
11. Amal supplied 250 toys to a school and earned a profit of 12 % . If each toy costs him ₹ 240 , find his total selling price and total profit.
12. Find the gain percent if cost price of 9 articles is equal to the selling price of 5 articles.
13. If he bought a book for ₹18, spent ₹ 2 on its binding and sold it for ₹ 25 , find the gain percent of a book seller.

Solution :

$$CP = ₹ 18$$

Spent on binding = ₹ 2

Therefore Total CP = ₹ (18 + 2) = ₹ 20

SP = ₹ 25

Profit = ₹ (25 - 20) = ₹ 5

Profit percent = $\left(\frac{\text{Profit}}{\text{CP}} \times 100 \right) \%$

$$= \left(\frac{5}{20} \times 100 \right) \% = 25\%$$

14. Deepak incurred a loss of 15% on selling a mobile at the price of ₹ 15,300. At what price did Deepak purchase that mobile?

15. Vikas sold a bat for ₹ 2,400 at a loss of 20%. At what price Vikas should have sold the bat to make a profit of 20%

16. Two goats were bought at the same cost. One was sold at a profit of 8% and the other was sold at a loss of 10%. What is the cost price of each goat, if the actual difference of the selling prices were ₹ 180?

Solution : Let CP of each goat = x

SP of first goat = x + 8% of x = $\frac{108x}{100}$

SP of second goat = x - 10% of x = $\frac{90x}{100}$

$$\text{A/Q, } \frac{108x}{100} - \frac{90x}{100} = 180$$

$$(108 - 90)x = 180 \times 100$$

$$18x = 18000$$

Therefore, x = ₹ 1000

Therefore CP of each goat is ₹ 1000

17. Sonali sold each of her two radio sets at ₹ 2,500. On one she earned a profit of 7% and on the other she incurred a loss of 9%. What was the cost of each radio set?

EXERCISE : 8.6

1. Complete the table given below.

	Principal	Rate of interest (per annum)	Term	Interest
(a)	17980		3 years	2427.30
(b)	11820	7.8%		5531.76
(c)	21000	7%	2.4 years	3528
(d)	16000		8 years	3200
(e)		4%	15 month	2430

2. Sanyam has borrowed 22,800 from his friend at 4% per annum for 3 months. How much should he pay to clear off his debt?

Solution :

Here $P = 22,800$, $r = 4\%$ pa Time = 3 months = $\frac{1}{4}$ year

$$\text{Therefore SI} = \frac{P r t}{100}$$

$$\text{SI} = \frac{22800 \times 4 \times 1}{100 \times 4} = 228$$

$$\text{Amount} = P + \text{SI} = 22800 + 228 = 23,028$$

Therefore he should pay to clear off his debt = 23028

3. A farmer borrowed 17,000 at 12% per annum from a money lender. After 6 years and 6 months, he paid 19,000 and gave 2 of his goats. Find the cost of each goat.

4. Atul has deposited 15,800 in his bank account for 3 years and 3 months. How much money will he get, if the rate of interest is 7.8% per annum.

5. Lahid had invested in a bank scheme, which offers him the rate interest 8.6% per annum for 7.8 years. How much interest will he get if he had invested for 20,000?

6. Piyush borrowed 28,900 from a bank for a term of 3 years. How much he pay to clear his debt should if the rate of interest is $\frac{92}{17}\%$

7. Sumit has lent R 15,500 to Vishal at 4% per annum for 9 months. How much will Sumit get from Vishal after 9 months?
8. How much should Rohit invest to get a return of 18,000 as interest in 3 years at the rate of interest of 7.5% per annum?
9. If the rate of interest of 8% p.a. earns an interest of two-fifth of the principal, find the time period.
10. Sahil has paid 18,700 to clear his debt of R 17,000 after 2 years. What was the rate of interest?
11. Shikhar paid 31,062.50 to clear his debt after 2.5 years for a loan of 7 25.000. What was the rate of interest?
12. Akshay had 47,115 in his account after 4 years and 9 months. The bank offers an interest rate of 6.5% per annum. How much did Akshay deposit in his account initially?
13. John wants to earn an interest half as much as his principal amount. For how many years should John invest his money at an interest rate of 8% per annum?
14. Yash had asked for a loan at a rate of 5 % per annum for a period of 10 months. If he had paid ₹ 60 as interest, then find the principal that he had taken as loan.
15. A sum of money lent at simple interest amounts to R 2,500 in one year and 3.200 in 5 years. Find the sum of money and the rate of interest per annum.
16. Find a condition on x, y and z, where x, y and z are the three sums of money, such that y is the simple interest on x and z is the simple interest on y for the same time and same rate.

Solution :-

Let rate of interest = r% pa

Time = t years

$$A/Q, y = \frac{xrt}{100}$$

$$\text{Also, } z = \frac{yrt}{100}$$

$$Z = \frac{yrt}{100} = \frac{\left(\frac{xrt}{100}\right)rt}{100}$$

Therefore $y^2 = zx$

17. The simple interest on a certain sum for 2 years at 10% per annum is ₹ 795 less than the simple interest on the same sum for 5 years at 9% per annum. Find the sum.
18. Divide ₹ 30,000 into two parts such that the simple interest on the first part for 2 years at 8% per annum is equal to the simple interest on the second part for 4 years at the same rate of interest.