



MATHS

BOOKS - ICSE

RATIO AND PROPORTION

Solved Examples

1. Express each of the following ratios in simplest form :

54 : 63



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2. Express each of the following ratios in simplest form :

$$\frac{1}{6} : \frac{1}{9}$$



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3. Express each of the following ratios in simplest form :

$$4\frac{1}{2} : 1\frac{1}{8}$$



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4. Express each of the following ratios in simplest form :

$$1\frac{3}{4} : 2\frac{1}{2} : 1\frac{1}{6}$$



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5. Divide ₹ 3400 between A and B in the ratio 6 : 11



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6. Divide ₹ 7200 among A, B and C in the ratio

$$\frac{1}{3} : \frac{1}{6} : \frac{1}{4}$$



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7. A certain amount has been divided into two parts in the ratio 4 : 7 . If the first part is ₹ 600, find

the second part and



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8. A certain amount has been divided into two parts in the ratio $4 : 7$. If the first part is ₹ 600, find
the total amount



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9. Two numbers are in the ratio $3 : 7$ and their difference is 36. Find the number .



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10. If $a : b = 5 : 6$ and $b : c = 12 : 25$, find $a : c$



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11. If $a : b = 3 : 5$ and $b : c = 4 : 7$, find $a : b : c$



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12. Which ratio is greater, $13 : 24$ or $17 : 32$?



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13. Increase 224 in the ratio 7 : 9



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14. Check whether the following numbers are in proportion or not :

20, 18, 5, 6



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15. Check whether the following numbers are in proportion or not :

3.6, 0.4, 4.5, 0.5



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16. Find the value of x when $3\frac{1}{2} : x :: 2\frac{1}{2} : 4$



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17. Find the fourth proportional to 7 . 2, 1. 8, 8 .

4



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18. If 36, x , 16 are in continued proportion, find the value of x .



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19. Find the mean proportion between :
18 and 8



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20. Find the mean proportion between :

2 . 5 and 0 . 9



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21. Find the mean proportion between :

25, 15



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22. Find the mean proportion between :

$$7\frac{1}{5}, 6$$



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23. Find the mean proportion between :

$$3.6, 1.8$$



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24. If 6 books ₹ 615, how much do 10 books cost ?



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25. An aeroplane covers a distance of 2415 km in 6 hours. How distance will it cover in 8 hours ?



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1. Express each of the following ratios in simplest form :

20 : 35



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2. Express each of the following ratios in simplest form :

95 : 57



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3. Express each of the following ratios in simplest form :

$$2.1 : 1.2$$



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4. Express each of the following ratios in simplest form :

$$3\frac{1}{4} : 6\frac{1}{2}$$



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5. Express each of the following ratios in simplest form :

$$6a : 9b$$



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6. Express each of the following ratios in simplest form :

$$8ab^2 : 6a^2b$$



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7. Express each of the following ratios in simplest form :

$$\frac{1}{8} : \frac{1}{12}$$



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8. Express each of the following ratios in simplest form :

$$\frac{1}{9} : \frac{1}{6}$$



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9. Express each of the following ratios in simplest form :

$$\frac{2}{3} : \frac{5}{6}$$



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10. Express each of the following ratios in simplest form :

$$\frac{1}{4} : \frac{1}{6} : \frac{1}{8}$$



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11. Express each of the following ratios in simplest form :

$$1\frac{2}{3} : 2\frac{1}{2} : 1\frac{3}{4}$$



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12. Express each of the following ratios in simplest form :

$$2\frac{1}{3} : 3\frac{1}{4} : 1\frac{1}{6}$$



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13. Express each of the following ratios in simplest form :

35 paise : ₹ 1



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14. Express each of the following ratios in simplest form :

1 kg : 375 g



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15. Express each of the following ratios in simplest form :

60 cm : 1m



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16. Express each of the following ratios in simplest form :

400 m : 1 km



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17. Express each of the following ratios in simplest form :

$$8 \text{ months} : 1\frac{2}{3} \text{ years}$$



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18. Express each of the following ratios in simplest form :

$$6\frac{2}{3} \text{ hours} : 1 \text{ day}$$



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19. The angles of a triangle are in the ratio 5 : 6 : 7 . Find each angle .



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20. A line segment of length 84 cm has been divide into two parts in the ratio 4 : 3 . Find the length of each part



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21. Divide ₹ 3900 between Kunal and Kirti in the ratio 15 : 11



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22. Divide ₹ 16250 among A, B, C in the ratio 5 : 7 : 13



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23. Divide 35 sweets Sudha and Tanvy in the

ratio $\frac{1}{2} : \frac{1}{3}$



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24. Divide 468 g of rice into three heaps

containing the quantities in the ratio

$\frac{1}{6} : \frac{1}{8} : \frac{1}{12}$



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25. Divide ₹ 715 among A, B, C in such a way that B gets three times as much as A gets and C gets half of as much as B gets .



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26. Divide ₹ 760 among A, B, C such that A gets $\frac{5}{6}$ of what B gets and the ratio between the shares of B and C is 3 : 4



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27. The boys and girls in a school are in the ratio $8 : 3$. If the number of girls is 405 ,how many boys are there in the school



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28. An alloy contains copper and zinc in the ratio $7 : 3$. If it contains 12 . 6 g of copper, how much does this alloy weight ?



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29. Reena weighed 63 kg. She reduced her weight in the ratio 9 : 8 . Find her new weight .



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30. Two numbers are in the ratio 9 : 13 and their sum is 176 . Find the number .



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31. Two numbers are in the ratio 5 : 8 and their difference is 12 . find the number.



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32. If $a : b = 3 : 2$ and $b : c = 4 : 5$, find $a : c$



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33. If $a : b = 5 : 6$ and $b : c = 2.8 : 3.5$, find $a : c$



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34. If $p : q = 1\frac{1}{3} : 1\frac{1}{2}$ and $q : r = \frac{1}{2} : \frac{1}{3}$, find $p : r$



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35. If $a : b = 3 : 4$ and $b : c = 8 : 9$, find $a : b : c$



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36. If $l : m = 2\frac{1}{2} : 1\frac{2}{3}$ and $m : n = 1\frac{1}{4} : 3\frac{1}{2}$, find

$l : m : n$



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37. Which ratio is greater ?

(3 : 4) or (5 : 7)



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38. Which ratio is greater ?

(11 : 21) or (19 : 28)



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Exercise 7 B

1. Which of the following statements are true ?

$$51 : 68 = 85 : 102$$



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2. Which of the following statements are true

?

$$1.5 : 2.5 = 3.6 : 6$$



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3. Which of the following statements are true ?

$$30 \text{ bags} : 18 \text{ bags} = ₹ 450 : ₹ 270$$



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4. Which of the following statements are true ?

$$32kg : ₹36 = 8kg : ₹9$$



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5. Check whether the following numbers are in proportion or not :

30, 40, 45, 60



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6. Check whether the following numbers are in proportion or not :

2, $2\frac{1}{2}$, 3, $3\frac{1}{2}$



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7. Check whether the following numbers are in proportion or not :

0.8, 3, 2.4, 9



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8. Check whether the following numbers are in proportion or not :

$\frac{1}{5}$, $\frac{1}{8}$, $\frac{1}{4}$, $\frac{1}{10}$



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9. Check whether the following numbers are in proportion or not :

$$\frac{1}{2}, \frac{1}{5}, \frac{1}{6}, \frac{1}{15}$$



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10. Find the value of x in each of the following :

$$42 : 12 :: 7 : x$$



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11. Find the value of x in each of the following :

$$1.8 : x :: 2.4 : 6.0$$



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12. Find the value of x in each of the following :

$$6 : 0.8 :: x : 10$$



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13. Find the value of x in each of the following :

$$x : 1.6 :: 2.1 : 8.4$$



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14. Find the value of x in each of the following :

$$1\frac{1}{9} : x :: \frac{1}{3} : \frac{1}{4}$$



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15. Find the value of x in each of the following :

$$16 : x :: x : 25$$



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16. Find the fourth proportional to :

4, 9, 32



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17. Find the fourth proportional to :

15, 6, 7



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18. Find the fourth proportional to :

0.6, 1.5, 3



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19. Find the fourth proportional to :

$$\frac{1}{3}, \frac{2}{5}, 6$$



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20. Find the fourth proportional to :

$$2\frac{1}{2}, 2\frac{6}{7}, 3\frac{1}{2}$$



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21. Find the fourth proportional to :

3 hrs 12 min, 24 min, 1 m 68 cm



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22. Find the mean proportion between

81 and 121



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23. Find the mean proportion between

1.8 and 0.2



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24. Find the mean proportion between

$\frac{2}{3}$ and $\frac{8}{27}$



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25. Find the mean proportion between

0.32 and 0.08



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26. Find the mean proportion between

$\frac{1}{25}$ and $\frac{1}{16}$



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27. Find the third proportional to :

36, 12



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28. Find the third proportional to :

1.2, 0.6



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29. Find the third proportional to :

$$\frac{1}{9}, \frac{2}{3}$$



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30. Find the third proportional to :

1 m 60 cm, 40 cm



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31. Find the third proportional to :

1 kg 250 g, 500 g



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32. Find the third proportional to :

₹ 2 . 40 , ₹ 4 . 80



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33. Show that 6, 36, 216 are continued proportion.



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34. If 8 pens cost ₹ 356, what is the cost of 14 pens ?



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35. A uniform iron bar of length 7 m weight 22.4 kg. How much does the same bar of length 13 m weight ?



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36. A distance of 68 km is represented on a map by 1.7 cm . What distance is represented by 8.5 cm on the same map ?



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37. A bus is running at a uniform speed. It covers a distance of 435 km in 6 hours. How much distance will it cover in 8 hours ?



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38. If 15 men can dig a trench 35 m long in 1 day, then how many men can dig a similar trench 84 m long in 1 day ?



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Example

1. Arun is walking at a speed of 6 km per hour.

Find the: a. distance Arun will cover in 2 hours.

b. time Arun will take to cover 4 km.



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2. Ritu types 540 words in half an hour. How

many words will she type in 9 minutes?



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3. The thickness of 500 sheets of paper is 3.5 cm. What will be the thickness of 350 sheets of this paper?



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4. 35 cartons of 24 soap bars each cost ₹ 15,120. Find the cost of 20 cartons of 40 soap bars each.



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5. Ajay takes 22.5 minutes to reach Geeta's house if he drives at an average speed of 40km/hr. Geeta takes 15 minutes to reach Ajay's house. Find the distance between the houses of Ajay and Geeta. Also, find Geeta's average speed.



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6. Divide 98 marbles between piyush and ankur in the ratio 3:4.



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7. Divide ₹440 in the ratio $\frac{1}{6} : \frac{1}{9} : \frac{1}{3}$.



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8. A bag contains 5, 10, and 20 notes in the ratio 4:7:5. If there are 80 notes in all, find the amount of money in the bag.



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9. Arrange the ratios 5:6, 7:10, and 13:15 in ascending order.



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10. Arrange the ratios 4:5, 11:20, and 9:25 in descending order .



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11. Find x given that $5 : x :: 13 : 39$.



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12. What must be added to each of the four numbers 6, 9, 12, and 17 such that the new numbers are in proportion?



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13. A map is made with the scale 1 cm: 50,00,000 cm. If the distance between two

cities on the map is 4 cm, find the actual distance between the two cities in kilometres.



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14. Are 3, 6 and 12 in continued proportion?



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15. If $A = 2B = 5C$ find the ratio $A : B : C$.



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16. If $X:Y = 2:3$ and $Y:Z = 3:4$ find $X:Z$.



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17. If $a:b = 3:5$ find $2a + 3b: 4a + 5b$



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18. A can is $\frac{1}{4}$ th full of water. When this water is poured into another can, the other can is

$\frac{3}{5}$ th full of water. Find the ratio of the capacity of the first can to that of the second.



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19. The LCM of two numbers which are in the ratio 3:8 is 144 . Find the two numbers



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20. The ratio of the ages of Riti and Nakul is 2:3. Eight years ago, the ratio of their ages was

2:5. Find! their present ages.



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Try This

1. A private taxi charges a fare of 2600 for a journey of 200 km. How much would it travel for ₹ 2951?



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2. A car covers 150 km in 3 hours. How much distance would the car cover in 12 minutes?



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3. Priti drives at an average speed of 80 km/h and reaches the post office from her house in 6 minutes. On her way back, Priti reaches her house in 4 minutes 48 seconds. Find the distance between Priti's house and the post

office and also Priti's average speed on the return journey.



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4. 30 cartons, each containing 18 packets of cookies, cost 4.860. Find the cost of 26 cartons, each containing 24 packets of cookies.



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5. A stationery box has 15 pencils and 21 pens.

Express in simplest form:

The ratio of the number of pencils to the number of pens



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6. A stationery box has 15 pencils and 21 pens.

Express in simplest form:

The ratio of number of pens to the total number of stationery items in the box





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7. Express the given ratios in simplest form:

a. 49:77 b. 55:99



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8. Find the ratio of :

300 mm to 8 cm



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9. Find the ratio of :

35 min to $1\frac{1}{2}$ h



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10. Find the ratio of :

1 kg 200 g to 3 kg 250 g



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11. Find the ratio of :

25 mm to 15 cm



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12. Find the ratio of :

40 min to $2\frac{3}{4}$ hours



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13. Compare the ratios 2:5 and 3:7.



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14. Write four equivalent ratios for a. 3:5 b. 5:9
c. 4:7



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15. Find the value of a given that 3, a , 5, 20 are in proportion.



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16. Divide 500 in the ratio 2:3:5.



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17. Divide 714 marbles between Alok and Kabeer in the ratio 3:4.



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18. A purse contains ₹1 and 2 coins in the ratio 7:4. If there are 242 coins in the purse, find the total amount of money in the purse.



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19. Arrange the following ratios in descending order. (5:6), (7:8), (9:10)



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20. Arrange the following ratios in ascending order. (3:8), (5:9), (13:36)



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21. What number should be added to each of the four numbers 4, 1, 26, and 12 so that the new numbers are in proportion?



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22. Check whether the following numbers are in continued proportion: a. 4, 16, 64 b. 5, 15, 50



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23. A 2 feet tall child casts a shadow that is 3 feet long. Find the height of the boy whose shadow is $7\frac{1}{2}$ feet long.



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24. If $A=3B = 5C$, find $A:B:C$.



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25. If $A:B = 1:3$ and $B: C = 2:5$. find $A:C$.



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26. Given that $x:y = 2:7$, find $3x + 5y : 2x + y$.



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27. Ravi weighs $\frac{2}{3}$ rd of the weight of his elder brother and $\frac{5}{9}$ th of the weight of his father.

Find the ratio of the weight of his elder brother to the weight of his father.



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28. Find two numbers which are in the ratio 2:7 and whose LCM is 126.



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29. The ratio of the ages of Arvind and Renu is 3:5. Five years hence, the ratio of their ages will be 4:5. Find their present ages.



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Exercise 8 1

1. Akhil is riding a bicycle at a speed of 12 km per hour. How much distance will Akhil cover in 3 hours and 40 minutes?



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2. Archit and Soha start from Point A in their respective cars. Archit reaches point B in 40 minutes and Soha reaches point B in 24 minutes. If Archit drives at an average speed of

45 km/h, find Soha's average speed and the distance between Points A and B.



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3. The height of 25 wooden boards is 18.75 inches. Find the height of 55 boards.



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4. 30 bags of gravel of 35 kg each cost ₹ 3150. Find the cost of 50 bags of 45 kg each.



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5. Divide the in the ratio indicated:

a. ₹714 between Pihu and Adil in the ratio 2:5.



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6. Divide the in the ratio indicated:

1696 g of flour between Uma and Navin in the ratio 3:5.



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7. Divide the in the ratio indicated:

2170 in the ratio $\frac{1}{2} : \frac{1}{3} : \frac{1}{5}$



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8. Divide the in the ratio indicated:

378 in the ratio $\frac{1}{3} : \frac{1}{6} : \frac{1}{7}$



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9. Compare the ratios :

3:5 and 6:7



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10. Compare the ratios :

3:11 and 2:9



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11. Arrange the given ratios as indicated:

2:3, 3:5, 4:9 in ascending order



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12. Arrange the given ratios as indicated:

3:7, 4:11, 5:13 in descending order



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13. Five pencils cost ₹32.50 and 8 pens cost ₹ 72. Find the ratio of the price of one pen to the price of one pencil.



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14. One shop is selling 26 pens for ₹ 234 and the other shop is selling 19 pens for ₹ 152.



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15. If $X = 5Y = 8Z$, find $X:Y:Z$.



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16. If $2A = 5B = 7C$, find $A:B:C$.



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17. If $A:B = 3:5$ and $B:C = 8:11$, find $A:C$.



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18. If $A:B = 2:7$ and $B:C = 9:13$, find $A:C$.



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19. If $x:y = 4:7$, find $2x + 5y : 3x + 4y$.



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20. If $x:y = 3:5$, find $4x + 5y : 6x + 7y$.



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21. If two numbers are in the ratio 3:5 and their LCM is 120, find the numbers.



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22. The LCM of two numbers is 224 and the numbers are in the ratio 4:7. Find the numbers.



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23. The sides of a triangle are in the ratio 1:2:3.

If the perimeter is 30cm, find the sides.



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24. A field is in the shape of a parallelogram.

The two adjacent sides are in the ratio 4:5. A

fence 216 m long is placed along the boundary

of the field. Find the sides of the

parallelogram.



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25. Find the value of x if: a. $x, 7, 9, 21$ are in proportion. b. $6, 15, 8, x$ are in proportion.



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26. What must be added to the given numbers so that they are in proportion? a. $1, 3, 10, 18$ b. $23, 34, 56, 78$



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27. Are the following numbers in continued proportion? a. 9, 15, 25 b. 8, 13, 26



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28. Geeta pours in equal amount of milk into two different vessels. One vessel is $\frac{4}{7}$ th full and the other is $\frac{3}{8}$ th full. Find the ratio of the volumes of the two vessels.



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29. A bottle of water is $\frac{3}{7}$ th full. This water is poured into another bottle which is now $\frac{2}{3}$ rd full. Find the ratio of the volume of the first bottle to the volume of the second bottle.



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30. A mixed fruit drink has apple, orange, and pineapple juice in the ratio of 2:3:6. Find the quantity of each juice in a carton containing 2.2 litres of juice.





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31. A bag contains ₹ 1, ₹ 2, and ₹ 5 coins in the ratio 4:1:2. The total sum of the money in the bag is ₹ 320. Find the number of coins of each kind.



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32. A map is made with the scale 2 cm = 550km. If the distance between two places in the map

is 5.25 cm, find the actual distance between the two places in kilometres and metres.



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33. The ratio of the ages of Riti and Arya is 3:8.

Eight years ago, the ratio of their ages was 1:6.

Find their present ages.



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Revision Exercise

1. 15 men can build a 16.5 m long wall in one day. How many men are required to build 66 m long wall in one day?



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2. 1152 bars of soap can be packed in 8 cartons. How many such cartons are required to pack 3888 bars?



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3. Alka and Ritu are participating in a race. Alka reaches the finishing line in 32 minutes and Ritu reaches the finishing line in 28 minutes 48 seconds. If Alka runs at an average speed of 9km/h, find the distance they run and also find Ritu's average speed.



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4. Write the following ratios in their simplest form. a. 36:81 b. 48:108 c. 14:91 d. 84: 124



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5. Write three equivalent ratios for each of the following: 2:7 3:7 5:6 4:9



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6. Find the ratio of: a. 455 mL to 1.5 L. b. 45 min to $3\frac{1}{30}$ h.



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7. A cake recipe uses 150 g sugar in 400 g of flour. Find the ratio of: a. sugar to flour b. flour to sugar c. sugar to the amount of sugar and flour



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8. Divide: a. ₹ 600 between A, B, and C in the ratio 2:3:7

b. ₹ 780 among three boys in the ratio :

$$\frac{1}{2} : \frac{1}{5} : \frac{1}{6}$$

c. Divide 150 m in the ratio 12:8:5.



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9. Arrange the given ratios as indicated:

a. In ascending order:

i. 2:3, 5:7, 5:6, 11:14 ii. 3:5, 2:7, 3:10, 9:14



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10. Arrange the given ratios as indicated:

a. In ascending order:

In descending order:

i. 2:3, 3:5, 5:6, 2:9 ii. 1:4, 3:5, 5:6, 7:10



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11. If $P=3Q = 7R$, find $P:Q:R$.



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12. If $P:Q = 2:9$ and $Q :R = 3:7$, find $P:R$.



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13. Given that $x:y= 2:7$, find $3x + 4y: 2x + 5y$.



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14. Two numbers are in the ratio $4:7$ and their LCM is 84. Find the two numbers.



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15. Jyoti's and Geeta's present ages are in the ratio of 1:4. After 16 years, the ratio of their ages will be 1:2 Find their present ages.



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16. Two bags of potatoes are such that the weight of one bag is 5.5 times the weight of the other. If the total weight of the two bags is 156 kg, find the weight of each bag.





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17. A cleansing agent is mixed with water in the ratio 1:7. In 400 L of solution, find the amount of the cleansing agent.



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18. In a mixed fruit drink, orange juice, apple juice, and pineapple juice are mixed in the ratio 11:10:9. Find the amount of the three juices in a carton of IL 200 ml of juice.



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19. Yellow, blue, and white colours are mixed in the ratio 7:6:3. How much of each colour is required in a can of 960 L of colour?



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20. Find a such that 3, a, 9, and 12 are in proportion.



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21. What should be added to each of the numbers 8, 32, and 11 so that the new numbers are in proportion?



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22. Are the following numbers in continued proportion? a. 9, 12, 16 b. 4, 11, 44



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23. A bag has 50, 100, and 200 notes in the ratio 3:7:5. If there are 90 notes in the bag find the amount of money in the bag.



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Warm Up Exercise

1. If Prashant buys two similar mobile phones for Rs. 18,000, find the cost of three mobile phones.



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2. Three kilograms of mangoes costs Rs. 195.

Find the cost of five kilograms of mangoes.



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Challenge

1. During his morning walk, Rajiv crosses a bridge in 7.5 minutes. If he walks at an average speed of 2 km/h, find the length of the bridge.

Sanjay crosses the same bridge in 5 minutes.

How much time would Sanjay take in covering

a distance of 1 km? Find the their speeds?



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