MATHEMATICS

Class-VII

Topic-15

RATIO & PROPORTION

15

RATIO & PROPORTION

TERMINOLOGIES

Ratio, Anticedent, Consequent, Proportion, Continued proportion, Mean proportional, Third proportional, Fourth Proportional, Invertendo, Alternendo, Componendo, Dividendo, Componendo and Dividendo.

INTRODUCTION :

Ratio is the comparison by division of same kind of quanties or the ratio of two quantities of same kind and in same units is a fraction that shows how many times the one quantity is of the other. The ratio *a is to b* is the fraction $\dfrac{a}{b}$, and is written as a : b. Lets understand it more clearly using an example :

Let the weights of Ram and his friend Shyam are 55 kg and 60 kg respectively. If we wish to compare weights of Ram and Shyam by difference, we say that Shyam is 5 Kg heavier than Ram

By comparing their weights by division, we can say that Shyam is $\dfrac{60}{55} = \dfrac{12}{11}$ kg heavier than Ram

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15.1 RATIO

The ratio of a number 'a' to another number 'b' (b ≠ 0) is a fraction and is written as a : b.

or $\qquad \dfrac{a}{b} = \dfrac{a \rightarrow \text{anticedent}}{b \rightarrow \text{consequent}}$

In the ratio **a : b**, the first term is '**a**' and the second term is '**b**'. A ratio is said to be in the simplest form if its two terms have no common factor other than 1.

NOTE :

(i) The ratio of two numbers is usually expressed in its simplest form.

(ii) In a ratio, we compare two quantities. The comparison becomes meaningless if the quantities being compared are not of the same kind i.e. they are not measured in the same units.
For example : It is just meaningless to compare 20 bags with 200 crows. Therefore, to find the ratio of two quantities, they must be expressed in the same units.

(iii) Since, the ratio of two quantities of the same kind determines how many times one quantity is contained by the other. So, the ratio of any two quantities of the same kind is an abstract quantity. In other words, ratio has no unit or it is independent of the units used in the quantities compared.

(iv) The order of the terms in a ratio a : b is very important. The ratio 3 : 2 is different from the ratio 2 : 3.

Illustration 15.1

Express the ratio 45 : 108 in its simplest form.

Sol. In order to express the given ratio in its simplest form, divide its first and second terms by their HCF. We have,

45 = 3 × 3 × 5 and 108 = 2 × 2 × 3 × 3 × 3

So, HCF of 45 and 108 is 3 × 3 = 9

$\therefore$ 45 : 108 = $\dfrac{45}{108}$ = $\dfrac{45 \div 9}{108 \div 9}$ = $\dfrac{5}{12}$ = 5 : 12.

Hence, 45 : 108 in its simplest form is 5 : 12.

(a) **Comparison of ratios**

In order to compare two given ratios, follow the following steps :

Step-I : Obtain the given ratios.

Step-II : Express each one of them in the form of a fraction in the simplest form.

Step-III : Find the L.C.M. of the denominators of the fractions obtained in step II.

Step-IV : Obtain first fraction and its denominator. Divide the L.C.M. obtained in step III by the denominator to get a number x (say).
Now, multiply the numerator and denominator of the fraction by x. Apply the same procedure to the other fraction.
Now, the denominators of all fractions will be same.

Step-V : Compare the numerators of the fractions obtained in step IV. The fraction having larger numerator will be larger than the other.

Illustration 15.2

Compare the ratios, 7 : 6 and 4 : 9.

Sol. Write the given ratios as fractions, so

7 : 6 = $\dfrac{7}{6}$ and 4 : 9 = $\dfrac{4}{9}$

Now, L.C.M. of 6 and 9 is 18.
Making the denominator of each fraction equal to 18, we have

$\dfrac{7}{6}$ = $\dfrac{7 \times 3}{6 \times 3}$ = $\dfrac{21}{18}$ and $\dfrac{4}{9}$ = $\dfrac{4 \times 2}{9 \times 2}$ = $\dfrac{8}{18}$

Clearly, 21 > 8.

$\therefore$ $\dfrac{21}{18}$ > $\dfrac{8}{18}$ $\Rightarrow$ $\dfrac{7}{6}$ > $\dfrac{4}{9}$.

Ask yourself

1. Compare 7 : 8 and 9 : 16

2. Find the ratio of 3 days to 30 hours.

3. Convert in lowest form
   (a) 1728 : 64 **(b)** 343 : 49 **(c)** 243 : 27 **(d)** 256 : 16

4. If A : B = 3 : 4, B : C = 2 : 3 then A : C will be ?

5. If A : B = 1½ : 3½ ; B :C = 5¼ : 7½, then find A : B : C

Answers

1. 7 : 8 > 9 :16   **2.** 12 : 5

3. **(a)** 27 : 1   **(b)** 7 : 1   **(c)** 9 : 1   **(d)** 16 : 1

4. 1 : 2   **5.** 3 : 7 : 10

15.2 PROPORTION

Before starting this topic lets deal with one situation.

In a horror movie featuring a giant beetle, the beetle appeared to be 50 feet long. However, a model was used for the beetle that was really only 20 inches long. A 30 inch tall model building was also used in the movie. How tall did the building seem in the movie ?

I am sure after completion of this topic one can easily answer this question.

An equality of two ratios is called a **proportion**. If a : b = c: d, then we write **a : b : : c : d.**
For example 40 : 70 = 200 : 350. So 40, 70, 200, 350 are in proportion.
The numbers a, b, c, d are in proportion if the ratio of the first two is equal to the ratio of the last two, i.e. a : b = c : d.

If four numbers a, b, c, d are in proportion, then **a** and **d** are known as extreme terms and **b** and **c** are called mean terms.
We observe that 2, 6, 18 and 54 are in proportion, because 2 : 6 = 18 : 54. Clearly, 2 and 54 are extremes whereas 6 and 18 are means.

Fourth Proportional : If a : b = c : d, then d is called the fourth proportional to a, b, c.

Four numbers are in proportion, if the product of extreme terms is equal to the product of middle terms,
i.e., a : b : : c : d if and only if ad = bc.
Consider the numbers 40, 70, 200, 350. We find that 40 : 70 = 200 : 350. So, the given numbers are in proportion. Clearly, 40 and 350 are extreme terms and 70 and 200 are middle terms.
Product of extremes = 40 × 350 = 14000, Product of middle terms = 70 × 200 = 14000.

(a) Continued proportion

Three numbers **a, b, c** are said to be in continued proportion if a, b, b, c, are in proportion.
Thus, if a, b, c are in continued proportion, then
  a, b, b, c are in proportion, i.e., a : b : : b : c.
$\Rightarrow$ Product of extreme terms = Product of mean terms
$\Rightarrow$ a × c = b × b
$\Rightarrow$ ac = b²
$\Rightarrow$ b² = ac.

(i) Mean proportional : If a, b, c are in continued proportion, then b is called the mean proportional between a and c.
Clearly, if b is the mean proportional between a and c, then b² = ac.

(ii) Third proportional : If a : b = b : c, then c is called the third proportional to a and b.

Illustration 15.3

Are 36, 49, 6, 7 in proportion.

Sol. We have,

Product of extremes = 36 × 7 = 252

Product of means= 49 × 6 = 294

Clearly, Product of extremes ≠ Product of means.

Hence, 36, 49, 6, 7 are not in proportion.

Illustration 15.4

If 3 : x : : 12 : 20, find the value of x.

Sol. We have

       3 : x : : 12 : 20

$\Rightarrow$ 3, x, 12, 20 are in proportion

$\Rightarrow$ Product of extremes = Product of means

$\Rightarrow$ 3 × 20 = x × 12

$\Rightarrow$ 60 = 12x

$\Rightarrow$ $\dfrac{12x}{12} = \dfrac{60}{12}$ [Dividing both sides by 12]

$\Rightarrow$ x = 5.

Illustration 15.5

Find out :

(i) The fourth proportional to 4, 9, 12.

(ii) The third proportional to 16 and 36.

(iii) The mean proportional between 0.08 and 0.18

Sol. **(i)** Let the fourth proportional of 4, 9, 12 be x.

Then, 4 : 9 : : 12 : x

$\Rightarrow$ 4 × x = 9 × 12

$\Rightarrow$ x = $\dfrac{9 \times 12}{4}$ = 27.

Fourth proportional to 4, 9, 12 is 27.

(ii) Let the third proportional to 16 and 36 is x.

Then, 16 : 36 : : 36 : x

$\Rightarrow$ 16 × x = 36 × 36

$\Rightarrow$ x = $\dfrac{36 \times 36}{16}$ = 81.

Third proportional to 16 and 36 is 81.

(iii) Mean proportional between 0.08 and 0.18

$= \sqrt{0.08 \times 0.18} = \sqrt{\dfrac{8}{100} \times \dfrac{18}{100}}$

$= \sqrt{\dfrac{144}{100 \times 100}} = \dfrac{12}{100} = 0.12$

Illustration 15.6

What must be added to the numbers 6, 10, 14 and 22 so that they are in proportion ?

Sol. Let the required number be x.

Then, 6 + x, 10 + x, 14 + x, 22 + x are in proportion.

$\Rightarrow$ Product of extremes = Product of means

$\Rightarrow$ $(6 + x)(22 + x) = (10 + x)(14 + x)$

$\Rightarrow$ $132 + 6x + 22x + x^2 = 140 + 10x + 14x + x^2$

$\Rightarrow$ $132 + 28x = 140 + 24x$

$\Rightarrow$ $28x - 24x = 140 - 132$

$\Rightarrow$ $4x = 8$

$\therefore$ $x = \dfrac{8}{4} = 2.$

Illustration 15.7

If three loaves of bread are consumed by 9 people, how many people will consume 9 loaves of bread ?

Sol. Suppose x people will consume 9 loaves of bread. More the people, more will be the number of loaves of bread required.

We have,

Number of People   Number of Loaves of bread

$\begin{matrix} 9 \\ x \end{matrix} \downarrow$ $\begin{matrix} 3 \\ 9 \end{matrix} \downarrow$

$\therefore$ $9 : x = 3 : 9$ [Direct proportion]

$\Rightarrow$ $9 \times 9 = x \times 3$

$\Rightarrow$ $81 = 3x$

$\Rightarrow$ $x = \dfrac{81}{3} = 27$

Hence, 27 people will consume 9 loaves of bread.

Ask yourself

1. If (x+2), 3, (3x - 4) and 7 are in proportion, Find x.

2. 25, 35, x are in continue proportion, find the value of x.

3. What number must be added to each numbers 7 and 9, so that it becomes 4 : 5.

4. Find the fourth proportional to the numbers 8, 10 and 12.

5. If $\dfrac{a}{3} = \dfrac{b}{4} = \dfrac{c}{7}$, then $\dfrac{a+b+c}{c} = ?$

Answers

1.   13   **2.**   49   **3.**   1   **4.**   15   **5.**   2

Add your knowledge

Invertendo : If $\dfrac{a}{b} = \dfrac{c}{d}$ then $\dfrac{b}{a} = \dfrac{d}{c}$.
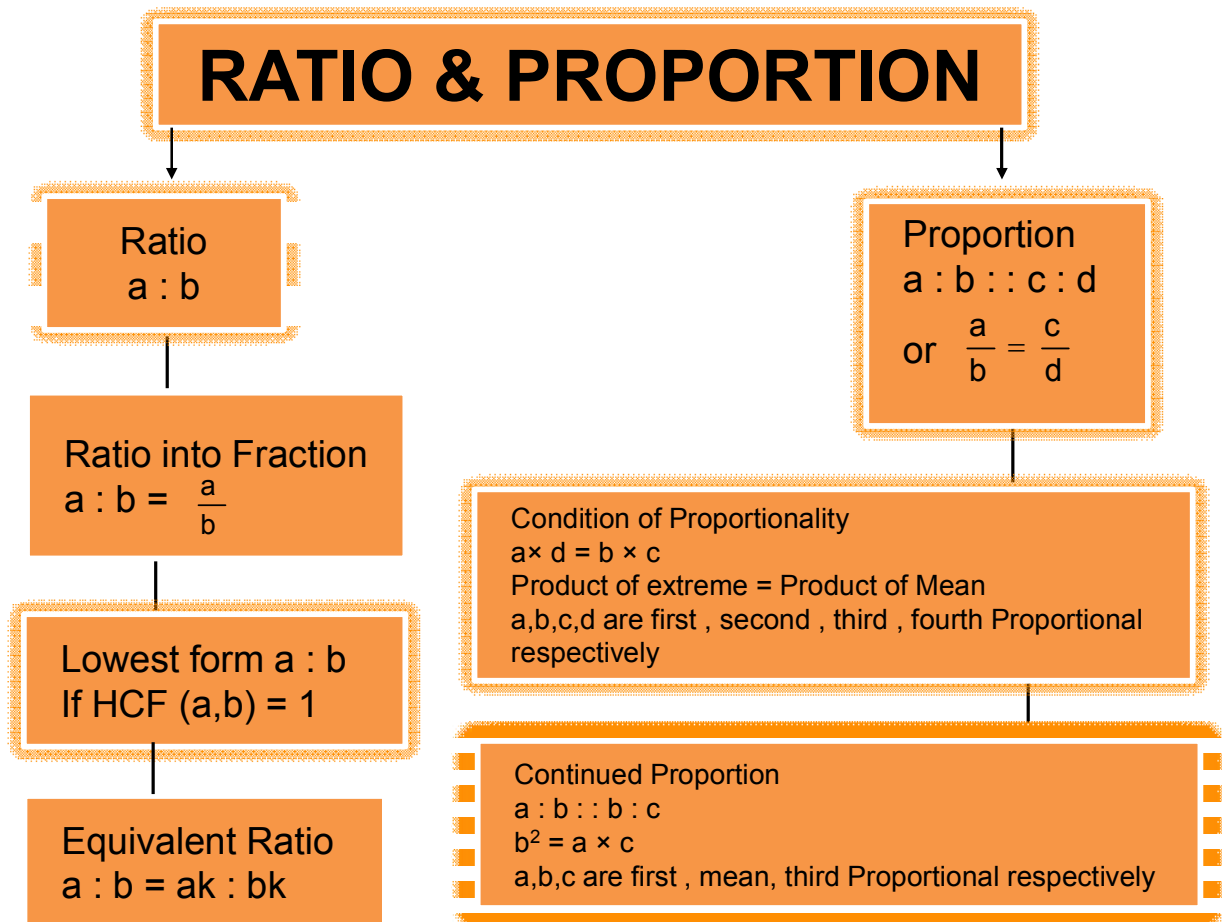
Alternendo : If $\dfrac{a}{b} = \dfrac{c}{d}$ then $\dfrac{a}{c} = \dfrac{b}{d}$.

Componendo : If $\dfrac{a}{b} = \dfrac{c}{d}$ then $\dfrac{a+b}{b} = \dfrac{c+d}{d}$.

Dividendo : If $\dfrac{a}{b} = \dfrac{c}{d}$ then $\dfrac{a-b}{b} = \dfrac{c-d}{d}$.

Componendo and Dividendo : If $\dfrac{a}{b} = \dfrac{c}{d}$ then, $\dfrac{a+b}{a-b} = \dfrac{c+d}{c-d}$

Concept Map

RATIO & PROPORTION

Ratio
a : b

Ratio into Fraction
a : b = $\dfrac{a}{b}$

Lowest form a : b
If HCF (a,b) = 1

Equivalent Ratio
a : b = ak : bk

Proportion
a : b : : c : d
or $\dfrac{a}{b} = \dfrac{c}{d}$

Condition of Proportionality
a× d = b × c
Product of extreme = Product of Mean
a,b,c,d are first , second , third , fourth Proportional respectively

Continued Proportion
a : b : : b : c
$b^2 = a \times c$
a,b,c are first , mean, third Proportional respectively

Summary

1. The ratio of a number 'a' to another number 'b' (b ≠ 0) is a fraction and is written as a : b.

   or $\dfrac{a}{b} = \dfrac{a \rightarrow \text{anticedent}}{b \rightarrow \text{consequent}}$

2. To compare two quantities, their units must be same.

3. Two ratios can be compared by converting them into like fractions. If the two fractions are equal, we say that the two given ratios are equivalent

4. The order of the terms in a ratio a : b is very important. The ratio 3 : 2 is different from the ratio 2 : 3.

5. If two ratios are equivalent, then the involved four quantities are said to be in proportion.

6. The numbers a, b, c, d are in proportion if the ratio of the first two is equal to the ratio of the last two, i.e. a : b = c : d.

7. If four numbers a, b, c, d are in proportion, then **a** and **d** are known as extreme terms and **b** and **c** are called middle terms.

8. Four numbers are in proportion, if the product of extreme terms is equal to the product of middle terms,
   i.e., a : b : : c : d if and only if ad = bc.

9. If a:b::b:c, then
   (i) a,b,c are said to be in continue proportion.
   (ii) c is called third proportional to a,b and fourth proportional to a,b,b.
   (iii) $\dfrac{a}{b} = \dfrac{b}{a} \Rightarrow b^2 = ac \Rightarrow b = \sqrt{ac}$ and, b is called the mean proportional between a and c.

EXERCISE » 01

MULTIPLE CHOICE QUESTIONS

1.   The ratio of $4^{3.5} : 2^5$ is same as :
     (A) 2 : 1   (B) 4 : 1   (C) 7 : 5   (D) 7 : 10

2.   225 % is equal to
     (A) 9 : 4   (B) 4 : 9   (C) 3 : 2   (D) 2: 3

3.   The ratio 3 : 8 is equal to
     (A) 3.75 %   (B) 0.375 %   (C) 37.5%   (D) 265 %

4.   If the ratio of the areas of two circles is 100 : 1, then the ratio of their radii is :
     (A) 1 : 100   (B) 100 : 1   (C) 10 : 1   (D) 1 : 10

5.   The population of Rajasthan is 570 lakhs and population of U.P. is 1560 lakhs in the same
     area . The ratio of their population is :
     (A) 20 : 23   (B) 33 : 11   (C) 19 : 52   (D) 19 : 62

6.   If A : B = 3 : 4, B : C = 2 : 3 then, A : C =
     (A) 1 : 2   (B) 5 : 3   (C) 1 : 3   (D) 2 : 3

7.   In a ratio, which is equal to 3 : 4, if the antecedent is 12, then the consequent is :
     (A) 9   (B) 16   (C) 20   (D) 24

8.   If x : y = 5 : 2, then (8x + 9y) : (8x + 2y) is :
     (A) 22 : 29   (B) 26 : 61   (C) 29 : 22   (D) 61 : 26

9.   If 0.4 of a number is equal to 0.06 of another number, the ratio of the numbers is :
     (A) 2 : 3   (B) 3 : 4   (C) 3 : 20   (D) 20 : 3

10. 0.5 of a number is equal to 0.07 of another number. Find the ratio of the two numbers.
     (A) 3 : 5   (B) 7 : 50   (C) 7 : 5   (D) 5 : 7

11. In a school 10% of the boys are same in number as $\dfrac{1}{4}$th of the girls. What is the ratio of
     boys to girls in that school ?
     (A) 3 : 2   (B) 5 : 2   (C) 2 : 1   (D) 4 : 3

12. 3 trays, each containing 30 eggs, cost Rs.180 .Find the cost of 4 cartons of eggs, if each
     carton contain 12 eggs.
     (A) Rs. 216   (B) Rs. 96   (C) Rs. 72   (D) Rs. 100

13. If P : Q : R = 1 : 2 : 3 and P's investment is Rs 15000, then what is the investment of R ?
     (A) Rs. 30,000   (B) Rs. 40,000   (C) Rs. 45,000   (D) Rs. 50,000

14. A purse contains Rs.50, 10 and Rs.5 note in the ratio 6 : 3 : 7 and the total amount in the purse is Rs.730. Find the number of Rs.5 notes in the purse.
(A) 7   (B) 14   (C) 21   (D) 28

15. Three positive numbers are in the ratio 1 : 3 : 5. The sum of their squares is 875. Find the sum of the numbers.
(A) 45   (B) 90   (C) 75   (D) 150

16. Which of the following is in proportion ?
(A) 1 : 2: : 3 : 4   (B) 2 : 4 : : 6 : 8   (C) 2 : 3 : : 4 : 6   (D) 3 : 4 : : 5 : 6

17. If x : 6 : : 32 : 24 then, what is the value of x ?
(A) 7   (B) 8   (C) 6   (D) 5

18. If 8 : 12 : : 6 : x, then x is :
(A) 16   (B) 9   (C) 12   (D) 8

19. For what value of x will the ratio (7 + x) : (12 + x) be equal to 5 : 6 ?
(A) 18   (B) 20   (C) 24   (D) 36

20. The fourth proportional to 5, 8, 15 is :
(A) 18   (B) 24   (C) 19   (D) 20

21. If x, 27, 81 are in continued proportion, then the value of x is :
(A) 9   (B) 3   (C) 6   (D) 81

22. The mean proportional between 234 and 104 is :
(A) 12   (B) 39   (C) 54   (D) None of these

23. The mean proportion of two numbers is 24 and their third proportion is 72. Find the sum of the two numbers.
(A) 11   (B) 24   (C) 32   (D) 80

24. The third proportional to 0.36 and 0.48 is :
(A) 0.64   (B) 0.1728   (C) 0.42   (D) 0.94

25. The third proportional between 0.9 and 0.45 is :
(A) 0.2   (B) 0.25   (C) 0.225   (D) 0.3

FILL IN THE BLANKS

1. The ratio of the number of 30-days months to 31-days months in a year is _____.

2. The ratio $\frac{1}{8} : \frac{1}{9} : \frac{1}{3}$ in simplest form is _____.

3. Which ratio is smaller ? 7 : 10 or 2 : 5 _____.

4. if x : 5 = 18 : 30, then x = _____.

5. If the cost of 6 sandwiches is Rs. 96, the cost of 10 sandwiches is _____.

TRUE / FALSE

1. The ratio of 5 paise to 10 rupees is 1 : 200.

2. The simplest form of the ratio 380 : 570 is 2 : 19.

3. If $\dfrac{a}{b} = \dfrac{2}{3}$ and $\dfrac{b}{c} = \dfrac{6}{8}$, then c : a = 1 : 4.

4. The ratio 4 : 5 is greater than 3 : 4

5. If a, b, c are in continued proportion, then $a^2 = bc$.

MATCH THE COLUMN

1.

	Column–I		Column–II
(A)	In a: b, a is	(p)	a : c :: b : d
(B)	In a : b, b is	(q)	ad = bc
(C)	a : b = c :d	(r)	antecedent
(D)	a : b :: c : d	(s)	consequent
(E)	equality of two ratios	(t)	proportion

SECTION -B (FREE RESPONSE TYPE)

VERY SHORT ANSWER TYPE

1. Which is greater
(i) 4 : 7 or 9 : 11 **(ii)** 13: 40 or 5 : 8

2. If a : b = 3 : 5 and b : c = 6 : 7, find a : b : c

3. Two numbers are in ratio 4 : 11 and their sum is 135. Find the numbers.

4. The sides of a triangle are in ratio 2 : 3: 4 . If the shortest side is 6 cm, what is the perimeter of the triangle.

5. If 0.75 : x : : 5 : 8, then find x.

SHORT ANSWER TYPE

6. If 2A = 3B = 4C, then find A : B : C

7. The ratio of the number of men and women working in a tea garden is 3 : 2. If the total number of workers is 165, then find the number of men in the garden.

8. If $\dfrac{1}{5} : \dfrac{1}{x}$: : $\dfrac{1}{x} : \dfrac{100}{125}$, then find the value of x

9. A map uses 2 cm to represent 25 km. If the distance between two cities on the map is 6.4 cm, then what is the actual distance between them ?

10. What will be the ratio of third proportional to 12 and 30 and the mean proportional between 9 and 25 ?

LONG ANSWER TYPE

11. If $(4x^2 - 3y^2) : (2x^2 + 5y^2) = 12 : 19$, then, find $x : y$.

12. The ratio of the present ages of Salma and Mona is 2 : 3. Two years hence, the ratio of their ages will be 5 : 7. Determine their present ages.

13. Two numbers are in the ratio 2 : 3 and if 5 is subtracted from each, they are reduced to the ratio 3 : 5. Find the smaller number.

14. If $(7x + 4y) : (7x - 4y) :: (7p+4q) : (7p - 4q)$, then show that x, y, p and q are in proportion.

15. If a, b, c and d are in proportion, then show that $\dfrac{a^3 + 3ab^2}{3a^2b + b^3} = \dfrac{c^3 + 3cd^2}{3c^2d + d^3}$.

16. What should be added to each of 3,15, 38, and 134 so that they should become proportionate to each other

17. If a : b = 3 : 4, find the value of 2a – b : 3a – 2b.

EXERCISE » 02

SECTION -A (COMPETITIVE EXAMINATION QUESTION)
MULTIPLE CHOICE QUESTIONS

1. If 2A = 3B and 4B = 5C, then A : C is :
(A) 4 : 3   (B) 8 : 15   (C) 15 : 8   (D) 3 : 4

2. If 2A = 3B = 4C, then A : B : C is ;
(A) 2 : 3 : 4   (B) 4 : 3 : 2   (C) 6 : 4 : 3   (D) 20 : 15 : 2

3. If $\dfrac{1}{5} : \dfrac{1}{x} = \dfrac{1}{x} : \dfrac{1}{1.25}$, then the value of x is :
(A) 1.5   (B) 2   (C) 2.5   (D) 3.5

4. If $\dfrac{m}{n} = \dfrac{4}{3}$ and $\dfrac{r}{t} = \dfrac{9}{14}$, the value of $\dfrac{3mr - nt}{4nt - 7mr}$
(A) $-5\dfrac{1}{2}$ (B) $-\dfrac{11}{25}$ (C) $-1\dfrac{1}{4}$ (D) $\dfrac{-11}{14}$

5. If the sum of two numbers is 32 and their ratio is 11: 5, the numbers are --------
(A) 22, 10   (B) 24, 8   (C) 20, 12   (D) 21, 11

6. Rohan and Abhishek have some rupees in the ratio 8 : 5. If Rohan has Rs. 84 more than Abhishek, what is the amount with Abhishek ?
(A) Rs. 84   (B) Rs. 224   (C) Rs. 140   (D) None of these

7. The sides of a triangle are in the ratio $\frac{1}{2}:\frac{1}{3}:\frac{1}{4}$ and its perimeter is 104 cm. The length of the longest side is:
   (A) 52 cm   (B) 48 cm   (C) 32 cm   (D) 26 cm

8. The third proportional to $(x^2 - y^2)$ and $(x - y)$ is :
   (A) $(x + y)$ (B) $(x - y)$ (C) $\frac{x+y}{x-y}$ (D) $\frac{x-y}{x+y}$

9. The milk and water in two vessels A and B are in the ratio 4 : 3 and 2 : 3 respectively. In what ratio, the liquids in both the vessels be mixed to obtain a new mixture in vessel C containing half milk and half water?
   (A) 7 : 8   (B) 6 : 7   (C) 7 : 6   (D) 7 : 5

10. A can contains a mixture of two liquids A and B in the ratio 7 : 5. When 9 litres of mixture are drawn off and the can is filled with B, the ratio A and B becomes 7 : 9. How many litres of liquid A was contained by the can initially ?
    (A) 10   (B) 20   (C) 21   (D) 25

SECTION -B (TECHIE STUFF)

11. If $\frac{x}{y} = \frac{3}{2}$, then find the value of $\frac{x+y}{x-y}$
    (A) 3   (B) 5   (C) 10   (D) 15

12. If $p = x + y$ and $q = x - y$, then find the value of expression $\frac{p+q}{p-q} - \frac{p-q}{p+q}$
    (A) $\frac{x-y}{xy}$ (B) $\frac{x^2-y^2}{xy}$ (C) $\frac{x^2+y^2}{xy}$ (D) $\frac{x+y}{xy}$

13. Solve : $\frac{\sqrt{10+3x}+\sqrt{10-3x}}{\sqrt{10+3x}-\sqrt{10-3x}} = 3.$
    (A) 2   (B) 3   (C) 1   (D) 4

EXERCISE » 03

(PREVIOUS YEAR EXAMINATION QUESTIONS)

1. Ratio of 250 ml to 2 l is :   **[NSTSE 2009]**
   (A) 250 : 2   (B) 1 : 125   (C) 1: 8   (D) 250 : 200

2. If swapna gives jyoti Rs 7, swapna will have the same amount of money as jyoti. If jyoti gives swapna Rs 16, the ratio of the amount of money jyoti has to the amount of money swapna has will be 5: 7. How much does jyoti have ?   **[NSTSE 2010]**
   (A) Rs 181   (B) Rs 131   (C) Rs 91   (D) Rs 61

3. Divide 14 toffees between Ankita and Anshul in the ratio 5 : 2 respectively **[IMO-2010]**
   (A) 2,5   (B) 4,10   (C) 10, 4   (D) 40, 8

4. The ratio of Mr X' s score to Mr . Y' s score for a test is 8 : 9 . If Mr. Y had scored 30 marks lower, the ratio would have been 4 : 3 instead . How many marks did Mr X score?

[NSTSE 2011]

(A) 50   (B) 30   (C) 80   (D) 60

5. If P:Q:R =1:2:3 and P's investment is Rs 15000, then what is the investment of R ?

[NSTSE 2012]

(A) 30000   (B) 40000   (C) 45000   (D) 50000

6. Given ' a 'is 63% and c is 3/8, which of the following is the closest equivalent of the ratio a to c ? **[NSTSE 2014]**

(A) 0.595   (B) 1.680   (C) 0.381   (D) 0.006

7. There are 54 green apples and 30 more red than green apples in a container. What is the ratio of the number of red apples to the total number of apples? **[IMO-2012]**

(A) 5:9   (B) 5: 14   (C) 14: 23   (D) 23 : 14

8. The ratio of boys to girls in a club is 7 : 4. There are 21 fewer girls than boys. What is the total number of children in the club? **[IMO-2012]**

(A) 49   (B) 77   (C) 84   (D) 231

9. Jenny uses 36 beads to make 4 bracelets. How many of the same type of bracelets can Jenny make with 180 beads? **[IMO-2012]**

(A) 20   (B) 27   (C) 432   (D) 972

10. Statement I : If four quantities a, b, c and d are such that the ratio a : b is equal to the ratio c : d, then we say a, b, c and d are in ratio and a: b: c: d.
Statement II : If a : b = 5 : 9 and b : c = 4 : 7, then a : b : c = 20 : 36 : 63. **[IMO-2013]**
(A) Both statements I and II are true.
(B) Statement I is true and statement II is false.
(C) Statement I is false and statement II is true.
(D) Both statements I and II are false.

11. Mathematics textbook for class VII has 320 pages. The chapter 'Symmetry' runs from page 261 to page 272. The ratio of the number of pages of this chapter to the total number of pages of the book is _____. [**IMO-2014**]

(A) 11 : 320   (B) 3 : 40   (C) 3 : 80   (D) 272 : 320

12. Sachin is younger than Rahul by 4 years. If their ages are in the respective ratio of 7:9. then how old is Sachin? **[IMO-2014]**

(A) 16 years   (B) 18 years   (C) 14 years   (D) None of these

ANSWER KEY »

EXERCISE » 01

SECTION -A (FIXED RESPONSE TYPE)

MULTIPLE CHOICE QUESTIONS

Ques.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Ans.	B	A	C	C	C	A	B	C	C	B	B	B	C	B	A
Ques.	16	17	18	19	20	21	22	23	24	25					
Ans.	C	B	B	A	B	A	D	D	A	C					

FILL IN THE BLANKS

1. (4 : 7)   **2.** 9: 8: 24   **3.** (2 : 5)   **4.** 3   **5.** 160

TRUE / FALSE

1. True   **2.** False   **3.** False   **4.** True   **5.** False

MATCH THE COLUMN

1. (A) → r, (B) → s, (C) → q, (D) → (p), (E) → t

SECTION -B (FREE RESPONSE TYPE)

VERY SHORT ANSWER TYPE

1. **(i)** 9 : 11   **(ii)** 5 : 8   **2.** 18 : 30 : 35   **3.** 36, 99

4. 27cm   **5.** x = 1.2

SHORT ANSWER TYPE

6. 6 : 4 : 3   **7.** 99   **8.** 2.5   **9.** 80 Km

10. 75

LONG ANSWER TYPE

11. 3/2   **12.** 8 years, 12years   **13.** 20   **16.** 2   **17.** 2 : 1

EXERCISE » 02

SECTION -A (COMPETITIVE EXAMINATION QUESTION)
MULTIPLE CHOICE QUESTIONS

Ques.	1	2	3	4	5	6	7	8	9	10
Ans.	C	C	C	D	A	C	B	D	D	C

SECTION -B (TECHIE STUFF)

Ques.	11	12	13
Ans.	B	B	A

EXERCISE » 03

(PREVIOUS YEAR EXAMINATION QUESTIONS)

Ques.	1	2	3	4	5	6	7	8	9	10	11	12
Ans.	C	B	C	C	C	B	C	B	A	C	C	C