

Ratio and Proportion: Concepts, Solved Examples, & Preparation Strategies

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Ratio refers to the quantitative relation between two numbers or amounts or quantities. It shows the number of times one value contains the other value or is contained within the other value. Ratios are used when we require to express one number as the fraction of another. If we have two quantities, say x and y , then the ratio of x to y is calculated as x/y and is written as $x:y$. The first term of the ratio is called antecedent and the second term is called the consequent.

A proportion simply implies that one ratio is equal to the other. The proportion is signified by double colons. For example, ratio 6:8 is the same as ratio 3:4. This can be written as 6:8::3:4.

In this article, we are going to cover the key concepts of Ratio and Proportion along with the various types of questions, and tips and tricks. We have also added a few solved examples, which candidates will find beneficial in their exam preparation. Read the article thoroughly to clear all the doubts regarding the same.

If you've learned Ration and Proportion, you can move on to [Profit and Loss](#) concepts.

What is Ratio and Proportion?

The ratio of two quantities a and b is the fraction a/b and we write it as $a : b$.

In the ratio $a : b$, we call a as the first term or antecedent and b , the second term or consequent i.e. ratio $5 : 9$ represents $5/9$ with antecedent = 5, consequent = 9

The equality of two ratios is called proportion.

If $a : b = c : d$, we write, $a : b :: c : d$ and we say that a, b, c, d are in proportion.

Here, a and d are called extremes, while b and c are called mean terms.

Product of means = Product of extremes

Thus, $a : b :: c : d \Leftrightarrow (b \times c) = (a \times d)$

Compounded Ratio

If two or more ratios are given and the antecedent of one is multiplied with antecedent of others and consequents are multiplied with consequences of others, then the ratio obtained is called compound ratio.

The compounded ratio of the ratios (a : b), (c : d), (e : f) will be (ace : bdf)

Types of Proportion

Various types of questions are asked from the proportion, Some of them are as follows.

(a) Third Proportion

If $a : b = b : c$, then c is called the third proportion to a and b.

(b) Fourth Proportion

If $a : b = c : d$, then d is called the fourth proportion to a, b, c.

(c) Mean Proportion

Mean proportion of a and b will be root over ab.

Once you've mastered Ratio and Proportion, Also, learn more about [Simplification and approximation](#) concepts in depth!

How to Solve Question Based on Ratio and Proportion- Know all Tips and Tricks

Candidates can find different tips and tricks from below for solving the questions related to ratio and proportion.

Tip # 1: In ratio, if both the antecedent and the consequent are multiplied or divided by the same number (except 0) then the ratio will remain the same.

Tip # 2: If a proportion is such as $a:x::x:b$ then x is called the mean proportional or second proportional of a and b. And if a proportion is such that $a:b::b:x$ then x is called the third proportional of a and b.

Tip # 3: Componendo rule: If $a/b = c/d$ then $a+b / b = c+d / d$

Tip # 4: Dividendo rule: If $a/b = c/d$ then $a-b / b = c-d / d$

Tip # 5: Componendo & Dividendo rule: If $a/b = c/d$ then $a+b / a-b = c+d / c-d$

Tip # 6: Invertendo rule: If $a/b = c/d$ then $b/a = d/c$

Tip # 7: Alternendo rule: If $a/b = c/d$ then $a/c = b/d$

Also check [Problem on Ages](#) concepts here once you are through with Ratio and Proportion concepts!

Ratio and Proportion Solved Sample Questions

Question 1: If $A : B = 2 : 3$ and $B : C = 5 : 7$ then what is the ratio $A : B : C$?

Solution: $A : B = 2 : 3$ $B : C = 5 : 7$

Multiply by $3/5$ so as to make the ratio term of B Common, $B : C = 5 \times 3/5 : 7 \times 3/5$

$$\Rightarrow B : C = 3 : 21/5$$

$$A : B : C = 2 : 3 : 21/5$$

$$= 2 \times 5 : 3 \times 5 : 21/5 \times 5$$

$$\text{Hence, } A : B : C = 10 : 15 : 21$$

Question 2: What is the equivalent compound ratio of $17 : 23 :: 115 : 153 :: 18 : 25$

Solution: We know, compound ratio of the ratios $(a : b)$, $(c : d)$, $(e : f)$ will be $(ace : bdf)$ Thus, the compound ratio of $(17 : 23)$, $(115 : 153)$, $(18 : 25) = (17 \times 115 \times 18) / (23 \times 153 \times 25) = 2 : 5$

Question 3: If $3 : 27 :: 5 : ?$

Solution: If $3 : 27 :: 5 : ?$

$$3/27 = 5/?$$

$$? = 5 \times 27/3$$

$$? = 45$$

Question 4: Find the mean proportional between 14 & 15 ?

Solution: As we know that, mean proportional $= \sqrt{ab}$

$$\Rightarrow \sqrt{14 \times 15}$$

$$\Rightarrow 14.5$$

So, the mean proportional of 14 and $15 = 14.5$

Question 5: Mean proportional of 4 and 36 is a and third proportional of 18 and a is b . Find the fourth proportional of b , 12 , 14 .

Solution: Given,

Mean proportional of 4 and $36 = a$

$$\Rightarrow a^2 = 4 \times 36$$

$$\Rightarrow a = 12$$

Third proportional of 18 and $12 = b$

$$\Rightarrow 12^2 = 18 \times b$$

$$\Rightarrow b = 8$$

Fourth proportional of 8, 12 and 14

$$\Rightarrow 8/12 = 14/?$$

$$\Rightarrow ? = 21$$

Question 6: A bag has coins of Rs. 1, 50 Paise and 25 Paise in ratio of 5 : 9 : 4. What is the worth of the bag if the total number of coins in the bags is 72?

Solution:

$$\Rightarrow \text{Number of Rs. 1 Coins} = 5/18 \times 72 = 20$$

$$\Rightarrow \text{Number of 50 Paise coins} = 9/18 \times 72 = 36$$

$$\Rightarrow \text{Number of 25 Paise coins} = 4/18 \times 72 = 16$$

$$\Rightarrow \text{Total worth of the bag} = (20 \times 1) + (0.5 \times 36) + (0.25 \times 16) = 20 + 18 + 4 = \text{Rs. 42}$$

Question 7: If $18 : 13.5 :: 16 : x$ and $(x + y) : y :: 18 : 10$, then what is the value of y?

Solution: $18 : 13.5 :: 16 : x \Rightarrow x = (16 \times 13.5)/18 = 12$

Now,

$$(x + y) : y :: 18 : 10$$

$$(12 + y) : y :: 9 : 5 \Rightarrow 5(12 + y) = 9y$$

$$60 + 5y = 9y$$

$$4y = 60$$

$$y = 15$$

Question 8: There are a certain number of Rs.10, Rs.20 and Rs.50 notes available in a box. The ratio of the number of notes of Rs.10, Rs.20 and Rs.50 is 3 : 4 : 6. The total amount available in a box is Rs.2460. The amount of Rs.10 and Rs.50 in a box is –

Solution: Let the number of notes of Rs.10, Rs.20 and Rs.50 be 3a, 4a and 6a respectively. Given,

$$\Rightarrow 10 \times 3a + 20 \times 4a + 50 \times 6a = 2460$$

$$\Rightarrow 410a = 2460$$

$$\Rightarrow a = 6$$

$$\text{Number of notes of Rs.10} = 3 \times 6 = 18$$

Number of Notes of Rs.20 = $4 \times 6 = 24$ Number of notes of Rs.50 = $6 \times 6 = 36$

Required amount = $10 \times 18 + 50 \times 36 = \text{Rs.1980}$

Question 9: Mr. Raj divides Rs. 1573 such that 4 times the 1st share, thrice the 2nd share and twice the third share amount to the same. Then the value of the 2nd share is:

Solution:

Given:

Total amount = Rs. 1573.

Calculation:

Let the share of A, B and C is $4A : 3B : 2C$. $A : B : C = 1/4 : 1/3 : 1/2 = 3 : 4 : 6$

The value of the 2nd share = $(4/13) \times 1573 = \text{Rs. 484}$

Exams where Ratio and Proportion is Part of Syllabus

Questions based on Ratio and Proportion come up often in various prestigious government exams some of them are as follows.

- [SBI PO](#), [SBI Clerk](#), [IBPS PO](#), [IBPS Clerk](#)
- [SSC CGL](#), [SSC CHSL](#), [SSC MTS](#)
- [LIC AAO](#), [LIC ADO](#)
- [RRB NTPC](#), [RRB ALP](#)
- [UPSC](#)
- [MPSC](#)
- [KPSC](#)
- [BPSC](#)
- [WBPSC](#)
- Other State Level Recruitment Examinations

We hope you found this article regarding Ratio and Proportion was informative and helpful, and please do not hesitate to contact us for any doubts or queries regarding the same. You can also download the [Testbook App](#), which is absolutely free and start preparing for any government competitive examination by taking the mock tests before the examination to boost your preparation.

If you are checking Ratio and Proportion article, also check the related maths articles in the table below:

Linear Equations In Two Variables	Binomial Theorem
Complex Number	Algebraic Identities

Ratio and Proportion FAQs

Q.1 What is Ratio and Proportion?

Ans.1 Details regarding the ratio and proportions can be found above in the article. Kindly go through the article for the same.

Q.2 How many types of proportions are there?

Ans.2 Three types of proportions are third proportion, fourth proportion and mean proportion.

Q.3 How to solve the problem related to Ratio and Proportion?

Ans.3 Tips and tricks to solve the problems related to Ratio and Proportion are given above in the article. Kindly go through the article for the same.

Q.4 Where I will find some of the sample questions related to Ratio and Proportion?

Ans.4 Various example questions along with their solutions are given above in the article. Kindly go through the article for the same.

Q.5 In which exam questions from Ratio and Proportion come up?

Ans.5 Ratio and Proportion based questions come in various government competitive examinations on a regular basis. The names of such examinations are given above in the article.

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