Ratio and Proportion

1. **Ratio:**

The ratio of two quantities *a* and *b* in the same units, is the fraction http://www.indiabix.com/_files/images/aptitude/1-div-abyb.gif 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**.

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| Eg. The ratio 3 : 4 represents | 3 | with antecedent = 3, consequent = 4. |
| 4 |

**Rule:** The multiplication or division of each term of a ratio by the same non-zero number does not affect the ratio.

Eg. 4 : 5 = 8 : 10 = 12 : 15. Also, 4 : 6 = 2 : 3

1. **Proportion:**

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* http://www.indiabix.com/_files/images/aptitude/1-sym-bim.gif (*b* x *c*) = (*a* x *d*).

1. **Fourth Proportional:**

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

**Third Proportional:**

*a* : *b* = *c* : *d*, then *c* is called the third proportion to *a* and *b*.

Mean Proportional: Mean proportional between a and b is square root of ab.

1. **Comparison of Ratios:**

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| We say that (*a* : *b*) > (*c* : *d*)   http://www.indiabix.com/_files/images/aptitude/1-sym-bim.gif | *a* | > | *c* | . |
| *b* | *d* |

1. 25% of A is same as 40% of B. Find the ratio A:B

2. What same number must be added to each term of the ratio 9:16 to make 2:3?

3. A vessel is partially filled with a mixture of 91 litres of milk and water in the ratio of 6:7. Find the quantity of water to be added to change the ratio to 3:5.

4. The ratio of income of A to that of B is 3:5. After sometime the income is increased by Rs 600 and the ratio changes to 7:9. Find the income of A initially.

5. Rs 195 contained in a box consists of one rupee, 50 paise and 25 paise coin in the ratio of 5:6:7. Find the number of 50 paise coins.

6. Three vessels of equal capacity contain mixture of milk and water in ratio 5:3, 5:1, 1:2 respectively. If all the solutions are mixed find the final ratio?

7. If A:B = 1:3, B:C = 6:5, what is the value of A:B:C?

8. Two numbers are in the ratio 2:7. If each number is increased by 10, the ratio changes to 3:8. What are the two numbers?

9. In a mixture of 45 litres, milk and water are in the ratio 4:1. If 9 litres of water is added, what will be the ratio of milk and water in the final mixture?

10. Three numbers are in the ratio 3:4:5 such that the sum of their squares is 200. What is the middle number?

11. Rs 910 is divided among A, B and C so that thrice the share of A is equal to twice of B which is equal to four times that of C. What is the share of A?

12. A mixture contains alcohol and water in the ratio 4:3. If 5 litres of water is added to the mixture, the ratio becomes 4:5. Find the quantity of alcohol in the given mixture.

13. Two numbers are in the ratio 3:5. If 9 is subtracted from each, the new numbers are in the ratio 12 : 23. The smaller number is?