

RATIO AND PROPORTION

RATIO is the relationship between two quantities which express how many times one quantity is the other quantity of the same kind and in the same unit. Ex $3:4 = 3/4$

- ❖ Ratio between two quantities is obtained by dividing the first quantity by the second. Ex: $A = 36$ and $B = 24 \therefore$ Ratio of A and $B = A:B = \frac{36}{24} = \frac{3}{2} = 3:2$
- ❖ The two quantities in ratio are called its terms. The first term is called **antecedent** and the second term is called **consequent**.
- ❖ A ratio is a pure number and has **no unit**.
- ❖ A ratio should always be expressed in lowest terms.
- ❖ Continued ratios will be of the form $a:b$ and $b:c$

To Convert a Fractional Ratio into a Whole Number:

- Find the LCM of the denominators

$$\text{Ex: } \frac{1}{3} : \frac{1}{4} \gg \text{ LCM of } 3, 4 = 12$$

- Multiply each term of the ratio by this LCM and simplify

$$\frac{1}{3} \times 12 : \frac{1}{4} \times 12 \gg 4 : 3$$

PROPORTION : When four quantities are such that the ratio of first to the second is same as the ratio of third to fourth, the quantities are said to be in proportion.

$$\text{Ratios } 14 : 30 = \frac{14}{30} = \frac{7}{15} \text{ and } 63 : 135 = \frac{63}{135} = \frac{7}{15} \text{ are same,}$$

$$14, 30, 63, 135 \text{ are in proportion} = 14 : 30 :: 63 : 135$$

- The first and fourth terms are called as **extremes**
- The second and third terms are called as **means**
- **Product of extremes = Product of means**
- **The double colon (::) is used in place of sign of equality (=)**
- Fourth quantity is called **fourth proportion**.

Continued proportion:

- Three quantities are said to be in continued proportion, if the ratio of the first to the second is same as ratio of second and third i.e. $a : b = b : c$
- Second term is called **mean proportion**. i. e. $a : b = b : c$; **c, b is the mean proportional between a and c.**
- Third quantity is called **third proportion to first and second term**. i.e. $a : b = b : c$; **c is the third proportional between a and b.**

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Proportion $a : b : c$ indicates three ratios, namely $a : b$; $b : c$ and $a : c$

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