

CONCEPT OF RATIO

Ratio:

Ratio is the comparative relation between two quantities of same kind expressed in the same units.
Ratio is a pure number and does not have any unit.

Example No 1:

In a class test A secured 80 marks and B secured 40 marks out of 100 then we can compare that A secures double that of B.
So, Ratio is $80/40 = 2$.

In the ratio $a:b$ and a and b are called the terms of the ratio.

“ a ” is called the antecedent or first term and “ b ” is called the consequent or second term.

Example No 2:

In a ration $4:7$, 4 and 7 are called terms of ratio, 4 is called first term and 7 is called second term.

Properties of Ratio:

- 1) If both the terms of a ratio are multiplied or divided by the same non-zero number, the ratio remains unchanged.
- 2) The order of the terms in a ratio is important. Ratios $m:n$ and $n:m$ cannot be equal unless $m = n$
- 3) The ratio of two unlike quantities is not defined. For example, the ratio between 10 kg and 20 metre. Quantities to be compared (by division) must be in the same units.
- 4) To compare two ratios, covert them into equivalent like fractions.
- 5) When two ratio $m:n$ is in its lowest term, m and n are co – prime or their HCF is 1.

Ratio of equality and in-equality:

- 1) If $a = b$ then the ratio $a:b$ is called equal ratio
Example: $5:5$, $8:8$ etc. are equal ratios.
- 2) If $a > b$ then the ratio $a:b$ is called the ratio of greater inequality
Example: $7:4$, $9:3$ etc. are the ratios of greater inequalities.
- 3) If $a < b$ then the ratio $a:b$ is called the ratio of lesser inequality
Example: $3:9$, $5:8$ etc. are the ratios of lesser inequalities.

Inverse ratio or reciprocal ratio:

The inverse ratio of $a:b$ is $b:a$

Example: The inverse ratio of $4:9$ is $9:4$.

Different type of ratios:

Compound ratio: If two or more ratios are multiplied together then the ratio is called compounded ratio.

For the ratios $a:b$, $c:d$, $e:f$ the compounded ratio is $ace:bdf$.

Example: $3:4$, $5:7$, $2:3$ the compounded ratio is $30:84$ which is further reduced to $5:14$.

Duplicate ratio: If two equal ratios are compounded together then the resulting ratio is called duplicate ratio.

The duplicate ratio of two equal ratios $a:b$ and $a:b$ is $a^2:b^2$

Example: Duplicate ratio of $4:9$ is $16:81$.

Triplicate ratio: If three equal ratios are multiplied together then the resulting ratio is called triplicate ratio.

The triplicate ratio of three equal ratios $a:b$, $a:b$ and $a:b$ is $a^3:b^3$

Example: Triplicate ratio of $4:9$ is $64:729$.

Sub Duplicate Ratio : $\sqrt{a} : \sqrt{b}$ is the sub duplicate ratio of $a:b$

Example: $\sqrt{25} : \sqrt{49}$ is the sub duplicate ratio of $5:7$.

- 1) **Sub Triplicate Ratio:** $\sqrt[3]{a} : \sqrt[3]{b}$ is the sub triplicate ratio of $a:b$.
Example: $\sqrt[3]{8} : \sqrt[3]{125}$ is the sub triplicate ratio of $2:5$.

- 2) **Continued Ratio:** The continued ratio is the relation between the magnitudes of two or more ratios and is denoted by $a:b:c$.
Example: The continued ratio of $2:3$ and $4:10$ is $8:12:30$ i. e; $4:6:15$.

AUTHOR: SUPRITHA MARLA