

# Ratio and Proportion Tips

## Ratio

- Ratio is comparison of two numbers, to find out how many times one number is greater than (or less than) the other number. It is to express one number as a fraction of other. Ratio of two quantities  $a$  and  $b$  in same units, is the fraction  $a/b$ , where  $b \neq 0$ . It is represented as  $a : b$ , where  $a$  (Numerator) is called as an antecedent and  $b$  (Denominator) is called as a consequent. Multiplication or division of each term of a ratio by a constant does not affect the ratio.

## Proportion

- Proportion is a special form of algebra equation, is used to compare ratios or make equivalent fractions. The equality of two ratios is called as proportion,  $a/c = b/d$  which is represented as,  $a : b :: c : d$   $a$  and  $d$  are called Extreme terms,  $b$  and  $c$  are called mean terms.

- Direct and Inverse proportion,

- I. We say that  $a$  is directly proportional to  $b$ ,  $a \propto b$ ; if  $a = kb$  for some constant  $k$

- II. We say that  $a$  is inversely proportional to  $b$ ,  $a \propto 1/b$ ; if  $a = k/b$  for some constant  $k$ ,

## Things to remember

- Compounded ratio of  $(a : b), (c : d)$  is  $(ac : bd)$ , It is the ratio of product of first terms in every ratio to the product of second term in every ratio.

- For a ratio of  $a : b$ ,

Duplicate ratio of  $a : b = a^2 : b^2$

Sub-duplicate ratio of  $a : b = \sqrt{a} : \sqrt{b}$

Triplicate ratio of  $a : b = a^3 : b^3$

Sub- triplicate ratio of  $a : b = \sqrt[3]{a} : \sqrt[3]{b}$

Reciprocal of a ratio  $a : b = b : a$

- If  $a, b, c$  and  $d$  are in proportion,  $a/b = c/d$ ,  $a : b :: c : d$  then,

Product of extreme terms = Product of mean terms, i.e. $ad = bc$ .
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