

RATIO

Meaning of Ratio	Division of two quantities a and b of same units. Denoted by a:b
Inverse Ratio	b:a is inverse ratio of a:b
Compound Ratio	Compound ratio of a:b and c:d is ac:bd
Duplicate Ratio	Duplicate ratio of a:b is $a^2:b^2$
Sub-duplicate Ratio	Duplicate ratio of a:b is $\sqrt[2]{a}:\sqrt[2]{b}$
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Commensurate	If ratio can be expressed in the form of integers
Incommensurate	If ratio cannot be expressed in the form of integers
Continued Ratio	Ratio of three or more quantities e.g. a:b:c

PROPORTION

Proportion	a,b,c,d are in proportion if a:b = c:d [it is an equality of two ratios]
Term/ Proportional	first = a, second = b, third = c, fourth = d
Mean Proportional	In a continued proportion a:b=c:d, $b^2=ac$, b is called mean proportional
Cross Product Rule	If a:b=c:d, then ad = bc
Invertendo	If a:b=c:d, then b:a = d:c
Alternendo	If a:b=c:d, then a:c = b:d
Componendo	If a:b=c:d, then (a+b):b = (c+d):d
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Addendo	If a:b = c:d = e:f = = k, then also (a+c+e+.....):(b+d+f+....) = k

INDICES

Index / Indices	Here in 4^2 , 4 is base and 2 is power or index. Plural of index is indices
Basic 1	$a^0 = 1$, any number raised to power zero equals to 1
Basic 2	$\sqrt{a} = a^{1/2}$, $\sqrt[3]{a} = a^{1/3}$
Law 1	$a^m \times a^n = a^{(m+n)}$
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LOG

Basic	If $2^4=16$ [2 is base, 4 is power], then $\log_2 16 = 4$ (i.e log of 16 base 2)
How to remember?	2 should be raised to what power so that it becomes 16 2 ka kitna power karne wo 16 ho jaye, ans is 4
Standard Result	$\log_a a = 1$, $\log_a 1 = 0$
Law 1	$\log_a (mn) = \log_a m + \log_a n$
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