

**Ratio and Proportion**

School grade: K8

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# **Ratio**

By the ratio of numbers  and  , with  , the rational number is understood  .

The value of a ratio  is the number  which is obtained from the relationship  .

Example:

There are 12 girls and 16 boys in a class. We say that the ratio between the number of girls and that of boys is equal to  . The ratio value is  .

The percentage ratio is a shape ratio  , which is noted  .

Example:

The initial price of an object is 600 lei. It becomes more expensive by 30%. What is the new price?

# **Proportion**

The equality of two ratios is called a proportion.

If the ratio  and  have the same value, they form the proportion , and the numbers a, b, c, d they are called the terms of the proportion.

Terms a and d are called extremes, and terms b and d are called means.

Examples:

 .

The fundamental property of proportion: In a proportion, the product of the means is equal to the product of the extremes.



# **Derived proportions**

* The means or extremes are changed between them.



* Ratios are reversed



The rational numbers are considered , with  so that we have the proportion 

We can obtain the derived proportions:

1.  Both terms of the first ratio are multiplied by k.

2.  The numerators are multiplied by k.

3.  The denominators are multiplied by k.

4.  The denominators are added to the numerators and the denominators are left unchanged

5. 

The numerators are added to the denominators and the numerators are left unchanged

6. 

The denominators are subtracted from the numerators and the denominators are left unchanged.

7. 

Subtract the numerators from the denominators and leave the numerators unchanged

8. 

Add the numerator and denominator of the first ratio to the numerator and denominator of the second ratio.

9.  The numerator and denominator of the second ratio are subtracted from the numerator and denominator of the first ratio.