

Simple Ratios - A ratio is a way of comparing the relative magnitude of different quantities.

A, B, C20 : 30: 50

Simplification of Ratios - Division by common factors reduces the numbers used in a ratio.
The ratio 20 : 30 : 50 becomes 2 : 3 : 5 .

examples:

20 : 55

4 : 11 (dividing by 5)

39 : 12

13 : 4 (dividing by 3)

56 : 24

7 : 3 (dividing by 8)

Dividing by Ratio - This is the method to follow:

- Add up the numbers of the ratio to give the total number of 'parts'.
- Make fractions of each ratio number divided by the number total.
- In turn, multiply each fraction by the number that is to be divided up.

Example #1 - Divide 90 in the ratio 3 : 2

$$\text{total of ratio numbers} = 3 + 2 = 5$$

$$3:2, \quad \frac{3}{5} : \frac{2}{5}$$

$$\frac{3}{5} \times 90 = \frac{3 \times 90}{5} = \frac{270}{5} = 54$$

$$\frac{2}{5} \times 90 = \frac{2 \times 90}{5} = \frac{180}{5} = 36$$

Therefore 90 shared in the ratio 3 : 2 is 54 and 36

Example #2 - Divide 132 in the ratio 6 : 5

$$\text{total of ratio numbers} = 6 + 5 = 11$$

$$6:5, \quad \frac{6}{11} : \frac{5}{11}$$

$$\frac{6}{11} \times 132 = \frac{6 \times 132}{11} = \frac{792}{11} = 72$$

$$\frac{5}{11} \times 132 = \frac{5 \times 132}{11} = 5 \times 12 = 60$$

Therefore 132 shared in the ratio 6 : 5 is 72 and 60

Example #3 - Divide 288 in the ratio 2 : 6 : 4

total of ratio numbers = $2 + 6 + 4 = 12$

$$2:6:4, \quad \frac{2}{12} : \frac{6}{12} : \frac{4}{12}$$

$$\frac{2}{12} \times 288 = \frac{2 \times 288}{12} = \frac{288}{6} = 48$$

$$\frac{6}{12} \times 288 = \frac{6 \times 288}{12} = \frac{288}{2} = 144$$

$$\frac{4}{12} \times 288 = \frac{4 \times 288}{12} = \frac{288}{3} = 96$$

Therefore 288 shared in the ratio 2 : 6 : 4 is 48, 144 and 96

Proportional Change is when a quantity is increased or decreased by multiplication with the numbers of a ratio expressed as a fraction.

The first number of the ratio becomes the numerator, while the second becomes the denominator.

Example #1 - increase 56 in the ratio 3 : 2

$$56 \times \frac{3}{2} = \frac{56 \times 3}{2} = \frac{168}{2} = 84$$

Example #2 - decrease 78 in the ratio 4 : 9

$$72 \times \frac{4}{9} = \frac{72 \times 4}{9} = 8 \times 4 = 32$$