

- **Quantity:**

The quantity is related to amount which can be measured.

Ratio:

- **Definition:**

Relation obtained by comparing two quantities by division is known as ratio.

If a , b and K are non zero real numbers such that $a=bk$ then k is the ratio of a to b .

- **Writing manner:**

The ratio of a to b written as $a:b$ or $\frac{a}{b}$

- **Notes:**

1) The term a is the first term (antecedent) and the term b is called second term (consequent)

2) Second term b is always a non zero real number

3) A ratio is a number. It has no unit of measurement.

4) Two quantities of the ratio must be of the same kind.

5) Two quantities of the ratio must be in same unit.

6) Percentage is also a ratio having second term 100.

- **Properties of ratio:**

1) The ratio remains unchanged if both the terms of the ratio are multiplied or divided by same non zero number.

2) Simplest form

Since $\frac{a}{b} = \frac{ak}{bk}$ for every non zero number k

Therefore ratio $\frac{a}{b}$ and $\frac{ak}{bk}$ are the same and $\frac{a}{b}$ is its simplest form

- **Order Relation (comparison)**

Consider two ratios $\frac{a}{b}$ and $\frac{c}{d}$

1) If $a \times d > b \times c$ then $\frac{a}{b} > \frac{c}{d}$ where $b > 0, d > 0$

2) If $a \times d < b \times c$ then $\frac{a}{b} < \frac{c}{d}$ where $b > 0, d > 0$

3) If $a \times d = b \times c$ then $\frac{a}{b} = \frac{c}{d}$ where $b > 0, d > 0$

- Properties of equal ratios

Worksheet I

I) Observe the following table

Bananas	Cost
8 (a)	16 (c)
4 (b)	8 (d)

Find $\frac{a}{b}$ and $\frac{c}{d}$

What is your conclusion? **(equal ratios)**

II) Observe the following table

Bananas	Cost
4 (b)	8 (d)
8 (a)	16 (c)

Find i) $\frac{b}{a}$ and $\frac{d}{c}$ ii) $\frac{b}{a}$ and $\frac{c}{d}$

What is your conclusion? **(invertendo)**

III) Observe the following table

Bananas	Cost
8 (a)	4 (b)
16 (c)	8 (d)

Find i) $\frac{a}{c}$ and $\frac{b}{d}$ ii) $\frac{a}{d}$ and $\frac{b}{c}$

What is your conclusion? **(alternando)**

IV) Observe the following table

Bananas	Cost
8 + 4 (a + b)	16 + 8 (c + d)
4 (b)	8 (d)

Find i) $\frac{a+b}{b}$ and $\frac{c+d}{d}$ ii) $\frac{a+b}{c}$ and $\frac{c+d}{a}$

What is your conclusion ? **(componendo)**

V) Observe the following table

Bananas	Cost
8 - 4 (a - b)	16 - 8 (c - d)
4 (b)	8 (d)

Find i) $\frac{a-b}{b}$ and $\frac{c-d}{d}$ ii) $\frac{a-b}{c}$ and $\frac{c-d}{a}$

What is your conclusion ? **(dividendo)**

VI) Observe the following table

Bananas	Cost
$8+4$ ($a+b$)	$16+8$ ($c+d$)
$8-4$ ($a-b$)	$16-8$ ($c-d$)

Find $\frac{a+b}{a-b}$ and $\frac{c+d}{c-d}$

What is your conclusion?

(componendo and dividendo)