

## Critical Considerations in Comparing and Scaling Answers

The way to solve a value comparison problem is by :

**a. Determining the unit value**

This is done by determining the unit value of the quantities being compared, and then multiplying it by the quantity in question.

**b. Writing a value comparison**

Performed by direct comparison between two or more states Suppose two

quantities A and B are known.

A	B
$a_1$	$b_1$
$a_2$	$b_2$

Since like-for-like comparison applies, :

$$\frac{a_1}{a_2} = \frac{b_1}{b_2}$$

Based on the relationship obtained :

$$a_1 = \frac{a_2 \times b_1}{b_2} \quad \text{atau} \quad a_2 = \frac{a_1 \times b_2}{b_1} \quad \text{atau} \quad b_1 = \frac{b_2 \times a_1}{a_2} \quad \text{atau} \quad b_2 = \frac{b_1 \times a_2}{a_1}$$

**Sample Problem:**

1. A vehicle can travel 24 km by consuming 2 liters of gasoline. How many liters of gasoline are needed to travel 60 km?

Answer:

**Method 1:**

2 liters of gasoline can travel 24 km  
1 liter of gasoline can travel 12 km

So to travel 60 km, 60 liters of gasoline are needed:  $12 = 5$  liters.

**Method 2:**

A table is made as follows:

Bensin (lt)	Jarak(km)
2	24
x	60

The calculation is done with :

$$\frac{x}{2} = \frac{24}{60}$$

$$x = \frac{2 \times 60}{24}$$

$$= 5$$

So to travel 60 km, 60 liters of gasoline are needed:  $12 = 5$  liters.

2. 1 dozen shirts were purchased for Rp 480,000. What is the price of 15 pieces of the same shirt?

Answer:

**Method 1:**

1 dozen shirts costs Rp 480,000.

1 shirt costs Rp  $480,000.00 : 12 = \text{Rp } 40,000.00$

So the price of 15 pieces of clothes is  $15 \times \text{Rp } 40,000.00 = \text{Rp } 600,000.00$

**Method 2:**

A table is created as follows:

Baju (buah)	Harga (Rp)
12	480.000
15	x

The calculation is done with :

$$\begin{aligned} & 12 \quad 480.000 \\ & 15 \quad \times \\ & \times = \frac{15 \times 480.000}{12} \\ & \quad = 600.000 \end{aligned}$$

So the price of 15 pieces of clothes is  $15 \times \text{Rp } 40,000.00 = \text{Rp } 600,000.00$

Now you have learned the material of comparison worth, there are even 2 ways to answer the questions, please choose which alternative you consider easy, of course it's not difficult right?

#### 4. Inverse Value Comparison

An inverse value comparison deals with comparing two states where if one quantity increases/decreases then the other quantity decreases/increases.

Problems related to inverse comparison include:

- Number of workers and the time it takes to complete the job (for the same job)
- Speed with travel time (for the same distance)
- Number of livestock and time to finish the diet (for the same amount of fodder)
- And so on

Suppose two quantities A and B are known

A	B
$a_1$	$b_1$
$a_2$	$b_2$

Since inverse value comparison applies, :

$$\frac{a_1}{a_2} = \frac{b_2}{b_1}$$

Based on the relationship obtained :

$$a_1 = \frac{a_2 \times b_2}{b_1}, \text{ atau } a_2 = \frac{a_1 \times b_1}{b_2}, \text{ atau } b_1 = \frac{b_2 \times a_2}{a_1}, \text{ atau } b_2 = \frac{b_1 \times a_1}{a_2}$$

### Sample Problem:

1. A job will be completed in 42 days if done by 12 people. How long will the same job take if it is done by 14 people?

Answer:

A table is created as follows:

pekerja (orang)	Waktu (hari)
12	42
14	X

The inverse value comparison calculation is done by reversing one of the segments:

$$\begin{aligned} 12 &= x \\ 14 &= 42 \\ x &= \frac{12 \times 42}{14} \\ &= 36 \end{aligned}$$

So if the work is done by 14 workers, it will be completed in 36 days.

2. The distance from city A to city B is equal to the distance from city B to city C. If AB can be traveled at 40 km/h for 10 hours, how much speed should be added if the distance BC will be traveled for 8 hours?

Answer:

A table is created as follows:

Kecepatan (km/jam)	Waktu (jam)
40	10
x	8

The inverse value comparison calculation is done by reversing one of the segments:

$$\begin{aligned} \frac{40}{x} &= \frac{8}{10} \\ x &= \frac{40 \times 10}{8} \\ &= 50 \end{aligned}$$

The speed to be added is  $50 - 40 = 10$  km/h.