CHAIN RULE

S. No	Proportion	Details
1	Direct	If increase/decrease of 1 quantity is directly proportional to other, then both are said to be directly proportional to each other. i.e. 1 quantity increases other also increases vice versa.
2	Indirect	If increase of 1 quantity is there will be decrease in other quantity vice versa then both are said to be indirectly proportional to each other. i.e. 1 quantity increases other also decreases vice versa.

Note
In chain rule we compare one quantity/ item with other in problem solving.

Problems with solutions

1. If the cost of x metres of wire is d rupees, then what is the cost of y metres of wire at the same rate?

Solution
Cost of x metres = Rs. d.

Cost of 1 metre = Rs. $\frac{d}{x}$

Cost of y metres = Rs. $\frac{d}{x}$. y = Rs. $\frac{yd}{x}$.

2. 39 persons can repair a road in 12 days, working 5 hours a day. In how many days will 30 persons, working 6 hours a day, complete the work?

Solution
Let the required number of days be x.
Less persons, More days (Indirect Proportion)
More working hours per day, Less days (Indirect Proportion)

Persons 30 : 39
Working hours/day 6 : 5
} :: 12 : x

30 x 6 x x = 39 x 5 x 12

$x = \frac{(39 \times 5 \times 12)}{(30 \times 6)}$

x = 13.

3. If a quarter kg of potato costs 60 paise, how many paise will 200 gm cost?

Solution
Let the required weight be x kg.

Less weight, Less cost (Direct Proportion)

$250 : 200 :: 60 : x \Leftrightarrow 250 \times x = (200 \times 60)$

$x = \frac{(200 \times 60)}{250}$

$x = 48.$

4. In a dairy farm, 40 cows eat 40 bags of husk in 40 days. In how many days one cow will eat one bag of husk?

Solution

Let the required number of days be x.

Less cows, More days (Indirect Proportion)

Less bags, Less days (Direct Proportion)

Cows 1 : 40

Bags 40 : 1

} :: 40 : x

$\therefore 1 \times 40 \times x = 40 \times 1 \times 40$

$\Rightarrow x = 40.$

5. In a camp, there is a meal for 120 men or 200 children. If 150 children have taken the meal, how many men will be catered to with remaining meal?

Solution

There is a meal for 200 children. 150 children have taken the meal.

Remaining meal is to be catered to 50 children.

Now, 200 children $\equiv$ 120 men.

50 children $\equiv \left(\frac{120}{200} \times 50\right) = 30$ men.