

## Lesson - 11 Direct and Inverse variation

Variation :- If two quantities depend on each other in such a way that a change in one results in a corresponding change in the other, then the two quantities are said to be in variation. There are two types of variations:

(i) Direct variation.

(ii) Inverse variation.

(i) Direct variation :- If one quantity increase then the other quantity increase and one quantity decrease then the other quantity decrease, then they are called direct variation.

If two quantities  $x$  and  $y$  are in direct variation, the ratio of any two values of  $x$  is equal to the ratio of the corresponding values of  $y$ .

$$\frac{x_1}{x_2} = \frac{y_1}{y_2}$$

or

$$x_1 y_2 = x_2 y_1$$

Example I : If 12 toffees cost ₹ 30,  
what is the cost of 28 toffees?

Solution : Let the cost of 28 toffees be ₹  $x$ . Then, we have,

Toffees	12	28
COST (in ₹)	30	$x$

More toffees more the cost, then it is the case of direct variation.

$$\frac{12}{30} = \frac{28}{x}$$

$$\Rightarrow x = \frac{28 \times 30}{12}$$

$$x = 70$$

Hence, 28 toffees will cost ₹ 70.

Ans

Exercise 11.1 Complete



Inverse variation :- If two quantities

are such that increase in the value of one quantity causes the decrease in the value of the other quantity and vice-versa, then it is said that the two quantities are inversely proportional. If  $x$  and  $y$  are two quantities which are inversely proportional, then we write,

$$x \propto \frac{1}{y}$$

$\Rightarrow x = k \times \frac{1}{y}$ , where  $k$  is the constant of proportionality

$$\Rightarrow \boxed{xy = k}$$

$$\Rightarrow \boxed{x_1 y_1 = x_2 y_2}$$



Example :- If 16 men can build a wall in 10 days, how long will it take 20 men to build the same wall?

Solution :- Let the required number of days be  $x$ . Then, we have

Number of men	16	20
Number of days	10	$x$

More men will take less days to build the wall. Hence it is a case of inverse proportion.

$$16 \times 10 = 20 \times x$$

$$\Rightarrow x = \frac{160}{20}$$

$$\Rightarrow x = 8$$

Hence, They will take 8 days.

H:W

Exercise 11.2 Complete