Chapter- 10

Direct and Inverse Variations

Direct Proportion

If the value of a variable x always **increases** or **decreases** with the respective **increase** or **decrease** in value of variable y, then it is said that the variables x and y are in **direct proportion**.

For example: In the table below, we have variable y – Cost (in Rs) always increasing when there is an increase in variable x – Weight of sugar (in kg). Likewise if the weight of sugar reduced, the cost would also reduce. Hence the two variables are in **direct proportion**

Relation for Direct Proportion

Considering two variables x and y,
$x/y = k$ or $x=ky$ establishes the simple relation for direct proportion between x and y, where k is a constant.
So if x and y are in direct proportion, it can be said that
$x_1/y_1 = x_2/y_2$ where y_1 and y_2 correspond to respective values of x_1 and x_2.

Inverse Proportions

If the value of variable x **decreases** or **increases** upon corresponding **increase** or **decrease** in the value of variable y, then we can say that variables x and y are in **inverse proportion.**

For example: In the table below, we have variable y: Time taken (in minutes) reducing proportionally to the increase in value of variable x: Speed (in km/hour). Hence the two variables are in **inverse proportion.**

Relation for Inverse Proportion

Considering two variables x and y
$x/y=k$ or $x=ky$ establishes the relation for inverse proportionality between x and y, where k is a constant.
So if x and y are in inverse proportion, it can be said that
$x_1/x_2 = y_2/y_1$ where y_1 and y_2 are corresponding values of variables x_1 and x_2