BALABHADRA SKILL DEVELOPMENT ACADEMY
MATHS FORMULA - 15
ARITHMETIC

SPEED AND TIME

Sl	Situation	Formula
1	The distance travelled by any object or a person in unit time is known as speed of the object or a person.	$\text{Speed} = \frac{\text{Distance travelled}}{\text{Time taken}}$
2	To convert the speed of an object from km/h to m/s, multiply the speed by	$\frac{5}{18}$
3	To convert the speed of an object from m/s to km/h, multiply the speed by	$\frac{18}{5}$
4	If the ratio of speed of two objects is x:y then to cover the same distance, the ratio of time taken will be	y:x
5	If a man/vehicle covers two equal distances with the speed of x km/h and y km/h respectively, then the average speed of the man/vehicle to complete journey will be	$\frac{2xy}{x+y}$
6	If a person covers the same distances with there different speeds x km/h, y km/h and z km/h respectively, then his average speed will be	$\frac{3xyz}{xy+yz+zx}$ km/h
7	If a man changes his speed to (x/y) of his usual speed and gets late by t min, then the usual time taken by him	$\frac{t \times x}{(y-x)}$
8	If a person changes his speed to (x/y) of his usual speed and reaches early by t min, then the usual time taken by him	$\frac{t \times x}{(x-y)}$
9	When a man travel from A to B with a speed x km/h, he reaches t_1 h late and when he travels with a speed y km/h from A to B, he reaches t_2 h, earlier. Then, distance between A and B	$\frac{xy(t_1+t_2)}{y-x}$ km

10	If a vehicle P starts from A to B and another vehicle Q starts from B to A and they reach B and A respectively 't_1' and 't_2' time after the meeting, then	$\frac{Speed\ of\ P}{Speed\ of\ Q} = \sqrt{\frac{t_2}{t_1}}$
11	If speeds of two cars are a and b km/h (where, a>b) and they start from same point and at same time and in the same direction, (i) then their relative speed will be	(a-b) km/h
	(ii) and if the travel in opposite directions, then their relative speed will be	(a+b) km/h
12	When a person travels from A to B with speed x km/h, he reaches t_1, time late. When he increases his speed by y km/h to cover the same distance, he still gets late by time t_2, then distance between A and B	$(t_1 - t_2)(x + y)\frac{x}{y}$
13	Ram sees Gopal at a distance x m. He starts chasing Gopal who is running at a speed of a m/s, with speed of b m/s (where, b>a). Then, the distance covered by Gopal before he was caught	$x \times \left(\frac{a}{b - a}\right)$ m