Average speed

The Average speed, as obvious from the term itself, is the average of the speed of a moving body for the overall distance it has covered.

The average speed is a scalar quantity, which means, it is only represented by the magnitude and direction of travel is not important and is linked to the distance covered by the object.

Average Speed Formula

The formula for average speed is computed by calculating the ratio of the total distance traveled by the body to the time taken to cover that space. It is not the average of the speed.

The average speed equation is articulated as:

$$S_{AVG} = \frac{Total\ Distance\ Traveled}{Total\ Timetaken} \ldots\ldots\ldots(1)$$

$$S_{AVG} = \frac{D_{total}}{T_{total}} \ldots\ldots\ldots(2)$$

The equation (2) embodies the average speed formula of an object moving at a varying speed.

Average Speed Problems

The subsequent samples will help us comprehend how to **compute average speed**.
Solved Examples

Problem 1: A runner sprints at a track meet. He completes an 800-meter lap in 1 minute 20 sec. After the finish, he is at the starting point. Calculate the average speed of the runner during this lap?
Answer:

For calculating the Average speed of the runner, one must calculate the total distance traveled by him and the overall time taken to complete that distance.

In this case, the distance traveled by him is equal to 800 meters and he has completed it in 80 seconds.

So, applying formula for the average speed
we have

$$S_{AVG} = \frac{800}{80},$$

$$S_{AVG} = 10\, m/s,$$

Problem 2: Vikram drove his car for 4 hours at 50 miles per hour and for 3 hours at the speed of 60 miles per hour. Find his average speed for the journey?
Answer:
For finding the average speed we need to compute the full distance covered by Vikram.
$D_1 = 60 \times 3 = 180$ miles
$D_2 = 50 \times 4 = 200$ miles
Therefore, the total distance traveled is
$D = D_1 + D_2$
$D = 180 + 200$
$D = 380$ miles

So Average speed is

$$S_{AVG} = \frac{(380)}{(3+4)}$$

$$S_{AVG} = \frac{(380)}{(7)}$$

$$S_{AVG} = 54.29\, miles\, per\, hour$$

$$So,\ the\ average\ speed\ of\ the\ vikram's\ journey\ by\ car\ is\ 54.29\, miles\, per\, hour.$$