A body has speed V in first one-third of the total distance travelled, 2V in the next one third distance and 3V in the last one third distance. Calculate average speed.

Solution

If the total distance is ***S***, a body went the first one-third of total distance during the time $t_1 = \frac{\frac{1}{3}S}{V}$, second one-third of ***S*** during the time $t_2 = \frac{\frac{1}{3}S}{2V}$, last one-third of ***S*** during the time $t_3 = \frac{\frac{1}{3}S}{3V}$. Total time of travel is $t = t_1 + t_2 + t_3 = \frac{S}{3V} + \frac{S}{6V} + \frac{S}{9V} = \frac{11S}{18V}$.

From whence, average speed is

$$V_{average} = \frac{S}{t} = \frac{S}{t_1 + t_2 + t_3} = \frac{S}{\frac{11S}{18V}} = \frac{18}{11}V$$

Answer.

$$V_{average} = \frac{18}{11}V$$