

Distance, Time, Speed



v – average *speed*

$$v = \frac{d}{\Delta t}$$

d – *distance* travelled

$\Delta t = t_{final} - t_{initial}$ – travel *time*
 Δ (Delta) stands for “change”

Physical Quantity	Standard Units (metric system)	Other Units
Length, distance (d)	meter (m)	kilometer: 1km = 1000m centimeter: 1cm = 0.01 m 1 mile \approx 1.6 km; 1ft \approx 0.3m; 1inch \approx 2.5 cm
Time (t)	second (s)	hour: 1hr = 3600 s
Speed (s)	m/s	km/hr, mile/hr (mph) cm/s, km/s.....

Homework

Problem 1. Below is the schedule of “*Acela*” train that runs from Washington DC to New York City:

Washington (0 mi)	5:00 am
Baltimore (41 mi)	5:30 am
Philadelphia (135 mi)	6:30 am
New York (226 mi)	7:42 am



Find the average speed (in miles per hour, mph) for each of the three segments, and for the whole trip. Convert your results first to km/hr, and then to meters per second (m/s):

Segment	Speed (mph)	Speed (km/hr)	Speed (m/s)
Washington-Baltimore			
Baltimore-Philadelphia			
Philadelphia-NYC			
Washington-NYC			

Problem 2. A student travels from school to home by foot, with average speed $v=4\text{mph}$. There, she picks up a bike and rides it back three times as fast, along the same route. Calculate the average speed for her entire trip from school to home and back.

Hint: Assume the distance between her home and the school to be D .

To find the average speed, you need to find the total distance travelled and the total time.