Distance, Time, Speed

d – ***distance*** travelled

v – average ***speed***

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

$\Delta t = t_{final} - t_{initial}$ – 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 $1\,\text{mile} \approx 1.6\,\text{km};\ \ 1\text{ft} \approx 0.3\text{m};\ \ 1\text{inch} \approx 2.5\,\text{cm}$
Time (**t**)	second (s)	hour: 1hr = 3600 s
Speed (**s**)	m/s	km/hr, mile/hr (mph) cm/s, km/s……

Homework 3

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. Measure speed of a moving object (toy, rain drop on a window, a pet…). Sketch your experiment, record your data and compute the result (both in the units in which you made your measurements, and in m/s).

Problem 3. Have you ever wondered, who is faster – a snail or a sloth? Let us settle this question with scientific data. Let me first give you a quote from a news article about World Snail Racing Championship (yes, that's a thing!). "The 2019 championships were held on 20th July 2019 and this year's winner was a snail called Sammy owned by Maria Welby from Grantham, Lincolnshire. Sammy covered the 13 inch course in 2 mins 38 secs." As for the sloths, they hold the Guinness Record as the slowest mammal and an article on guinnessworldrecords.com claims "While on the ground, three-toed sloths travel at just 1.8–2.4 m (6–8 ft) per min". Would a sloth become the winner in World Snail Racing Championship (if admitted as a guest competitor)? Recalculate the speed of both species into the same units to justify your answer.