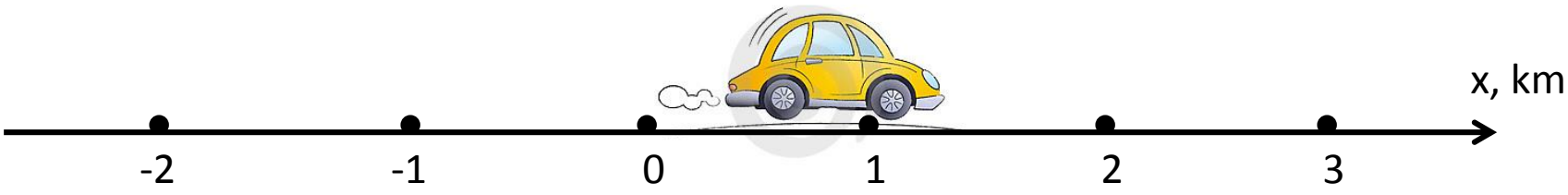
Velocity and Speed in 1D



Average ***velocity:***

$$\vec{v} = \frac{\Delta x}{\Delta t}$$

x_i, x_f - initial and finite positions.

$\text{displacement} : \Delta x = x_f - x_i$

$\text{travel time} : \Delta t = t_f - t_i$

Average ***speed:***

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

d – distance travelled

Problem 1.

A straight walkway connects a house with a beach. A dog named Einstein runs along that walkway towards the beach with speed speed 4 m/s, for 5 minutes. After that, the dog turns back and runs for another 10 minutes with speed 3m/s. Find:

a) The total distance travelled, d.
b) The total displacement of the dog, Δx. Let the positive direction be towards the beach.
c) Average *speed* and average *velocity* of the dog.

Problem 2

A Lion rest under a palm tree somewhere near Earth equator. Find the speed of the Lion due to the Earth spinning about its axis. Express the result in m/s, using scientific notations. Remember that circumference of the Earth is C=40000km