

Velocity and Speed in 1D



Average **velocity**:

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

x_i, x_f - initial and final positions.

displacement : $\Delta x = x_f - x_i$

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 4 m/s , for 5 minutes. After that, the dog turns back and runs for another 10 minutes with speed 3 m/s . Find:

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

Problem 2

A Lion rest under a palm tree somewhere near the Earth's 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 $C=40000\text{km}$