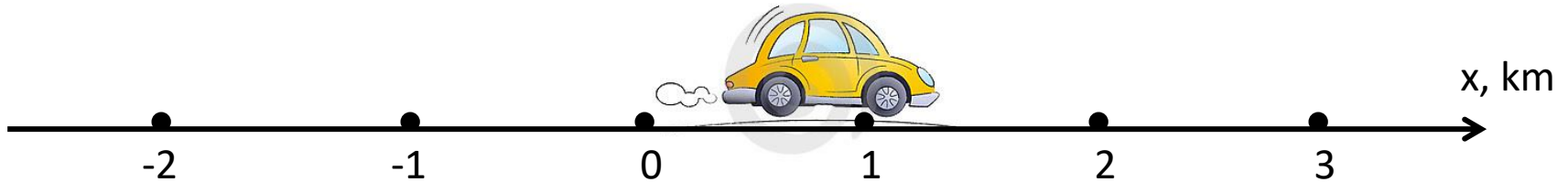


Distance and displacement in 1D



Distance:

$$d = |\Delta x| = |x_f - x_i|$$

The distance is just a measure of length. It can only be positive or zero.

x_f → final position in x axis.

x_i → initial position in x axis.

Displacement:

$$\Delta x = x_f - x_i$$

The displacement tells us the length **and** direction of a movement. Its sign matters!

In science, the Greek letter Δ usually represents the change or difference of a quantity. For example, Δt would represent the change in time between two events.

Homework 4

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 3m/s. Find:

- The total distance travelled, d .
- The total displacement of the dog, Δx . Let the positive direction be towards the beach.
- Average *speed* 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's spin about its axis. Express the result in m/s, using scientific notation. Assume that the circumference of the Earth is $C=40,000\text{km}$.