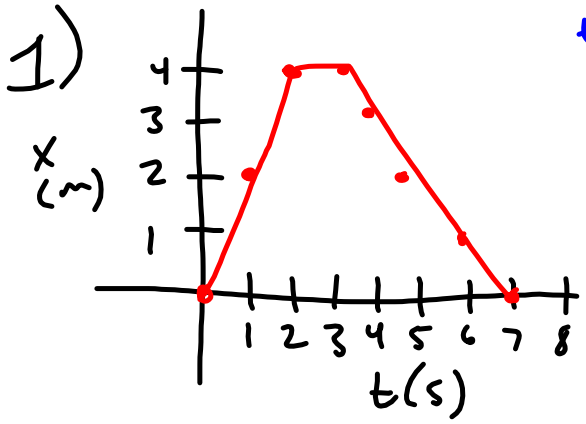
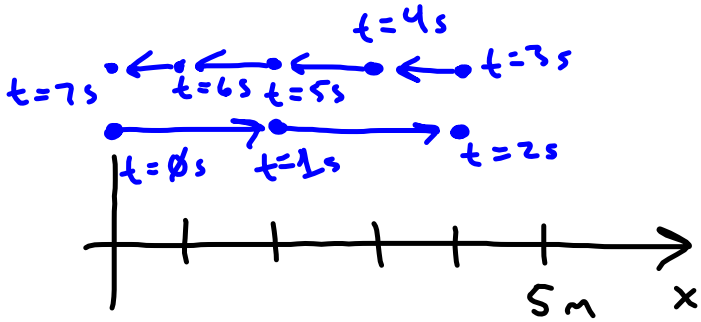
Position - time graphs to Motion Maps:

- Start with $t = \emptyset$ s.
- Each time interval (usually 1s) corresponds to a position

1)





position ⇒ where the object is
(x)

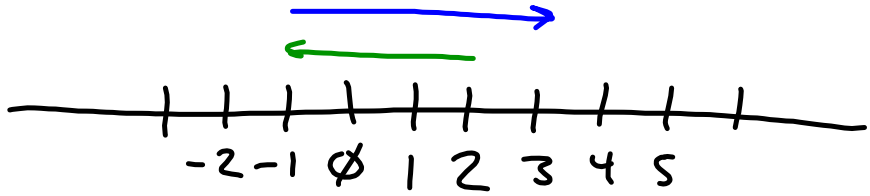
distance ⇒ scalar quantity that
(d) describes the to path length to change position

displacement ⇒ vector quantity that describes the relative change in position

$\vec{x}$

$\Delta \vec{x} = x_f - x_i$

displacement = final position − initial position



distance = 3 + 4 = 7

$\Delta x = 3 - 2 = 1$ East (Right)

$$\text{speed} = \frac{\text{distance}}{\text{time}} \qquad s = \frac{d}{t}$$

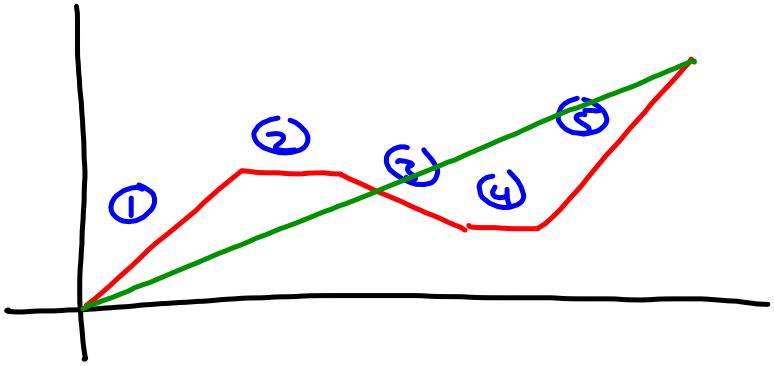
(always positive)

units: m/s

$$\text{Velocity} = \frac{\text{change in position}}{\text{change in time}} \qquad \bar{v} = \frac{\Delta \bar{x}}{\Delta t} = \frac{x_f - x_i}{t_f - t_i}$$

units: m/s

(need a direction → +/− or "label")



$$\bar{v} = \frac{x_f - x_i}{t_f - t_i} = \frac{8m - 0m}{16s - 0s} = \frac{1}{2}\ m/s$$

$$s = \frac{d}{t} = \frac{\overset{1}{4m} + \overset{2}{0m} + \overset{3}{2m} + \overset{4}{0m} + \overset{5}{6m}}{16\ s} = \frac{12m}{16\ s} = \frac{3}{4}\ m/s$$