Activities you can do at home

Draw an graph using the given data and find the velocity in (a) and acceleration in (b)

(a)

Position (m)	3	3	3	3	3
Time (s)	0	1	2	3	4

(b)

Velocity (m/s)	0	2	4	6	8
Time (s)	0	1	2	3	4

Step 1: Draw an x-axis and y-axis.

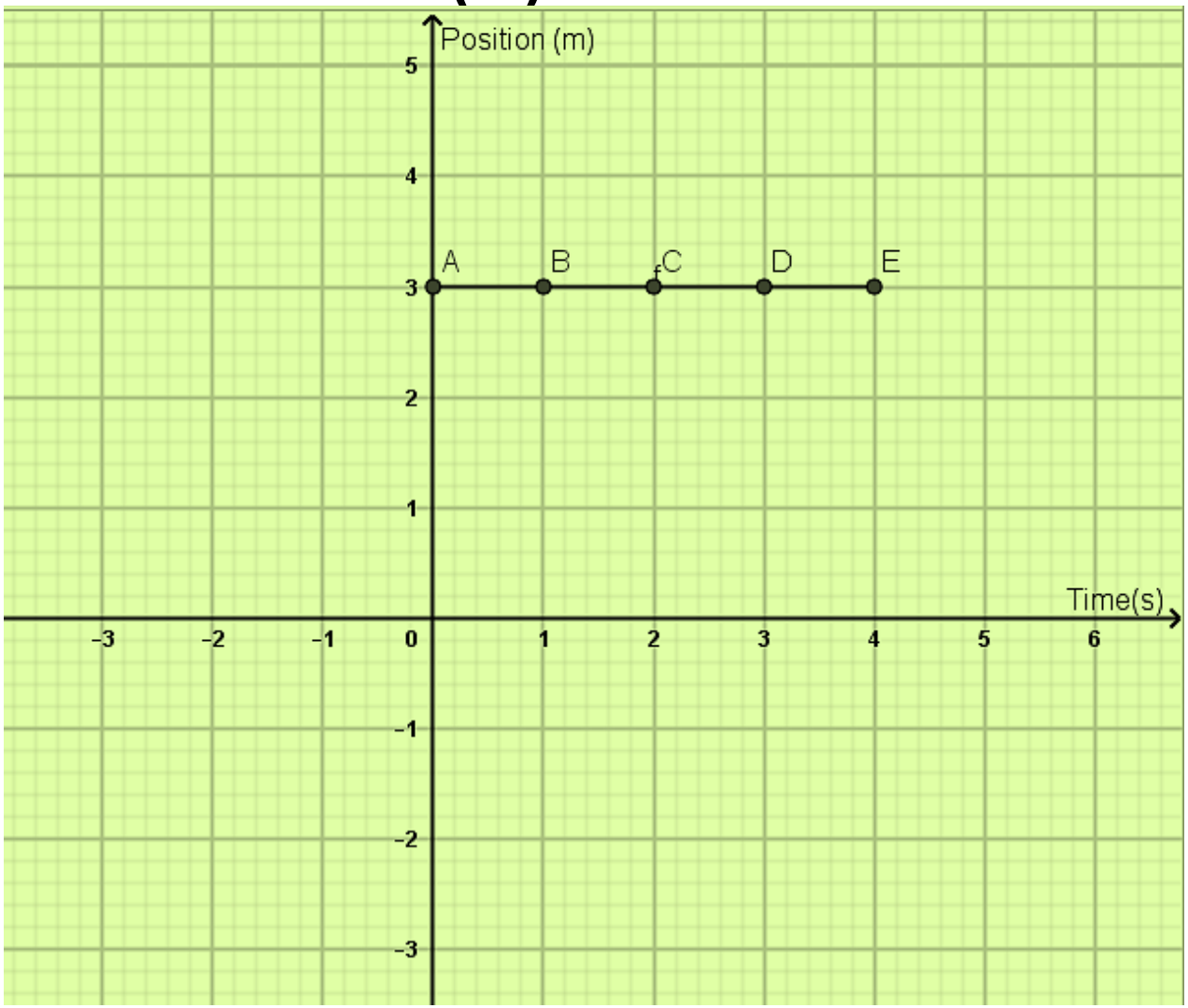
Step 2: label the x-axis and y-axis i.e. label Time(s) on x-axis and Position (m) or velocity (m/s)on y-axis

Step 3: Draw an graph using the given points.

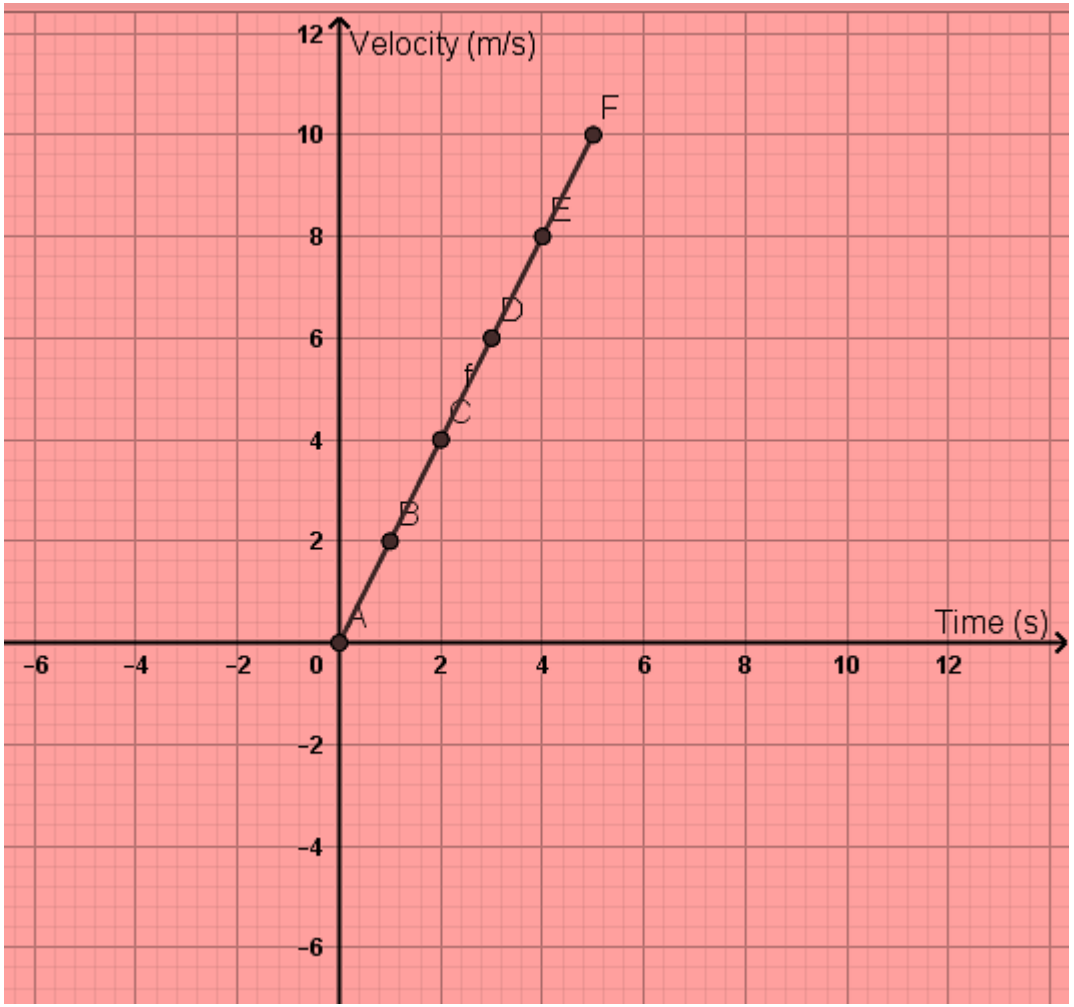
Step 4: Find the velocity or acceleration from the graph.

Let us draw

(a)



(b)



As you see in the graph (a), position is not changing with time i.e. position is constant. Therefore, velocity is zero in this case. It means that an object remains at the same position with change in time.

$$\mathrm{v} = \frac{dx}{dt} = 0$$

In graph (b), Velocity of an object is changing linearly with time that means Object has an acceleration. We can find acceleration by finding the slope i.e.

$$\mathrm{a} = \frac{dv}{dt} = \frac{(8-4)}{(4-2)} = 2\ \mathrm{m}s^{-2}$$

Try to draw graph

(a)

Displacement	0	2	6	4	2	0	-2	-4	-6
Time (s)	0	1	2	3	4	5	6	7	8

(b)

Velocity (m/s)	0	1	4	9	16	25	36
Time (s)	0	1	2	3	4	5	6

Answer the following questions

- In case of accelerated motion is the instantaneous velocity constant ?
- Why is the value of acceleration given by the slope of velocity time graph?
- What is the direction of acceleration for a car slowing down while heading north?
- Is it possible for a body to have constant acceleration while its speed remains constant ? What will the position time and acceleration time graphs look like ?
- Plot a position time graph for a body falling from a tall building.
- Plot a displacement time graph for a body falling from a tall building.
- Plot a velocity time graph for a body falling from a tall building.
- Plot a position time graph for a ball bouncing.
- Plot a position time graph for a boy on a swing.
- Plot a displacement time graph for a boy on a swing.

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