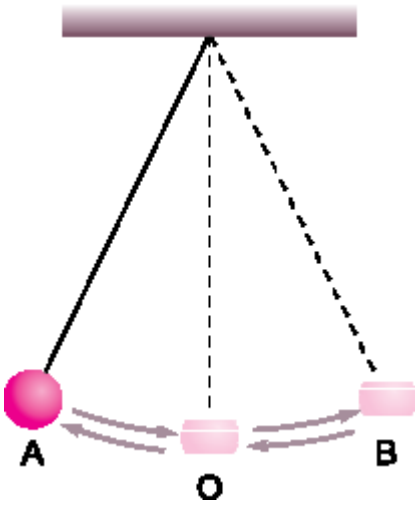
Very Short Answer Questions

Q.1. A simple pendulum is oscillating between two points A and B as shown in figure. Is the motion of the bob uniform or non-uniform?



[NCERT Exemplar]

Ans. Non-uniform

Q.2. Paheli and Boojho have to cover different distances to reach their school but they take the same time to reach the school. What can you say about their speed?

[NCERT Exemplar]

Ans. Their speed will not be same.

Q.3. If Boojho covers a certain distance in one hour and Paheli covers the same distance in two hours, who travels in a higher speed?

[NCERT Exemplar]

Ans. Boojho moves at a higher speed as he covers the same distance in a lesser time than Paheli.

Q.4. Define speed.

Ans. Speed is defined as the ratio of the total distance travelled by a body to the total time taken.

Q.5. Which speed is greater: 30 m/s or 30 km/h?

Ans. 30 m/s

Q.6. What is a pendulum?

Ans. A pendulum is a device which has a metallic ball (called bob) suspended by a long thread from a rigid support.

Q.7. What is the advantage of distance-time graphs?

Ans. It is useful in calculating the speed of the object and also tells the type of its motion.

Q.8. Define time period of a simple pendulum.

Ans. The time period of the simple pendulum is defined as the time required by the pendulum to complete one oscillation.

Q.9. The distance-time graph of an object is a straight line perpendicular to the distance axis. What does this graph indicate about the motion of the object?

Ans. It indicates that the object is not moving (stationary).

Short Answer Questions

Q.1. Distinguish between uniform and non-uniform motion.

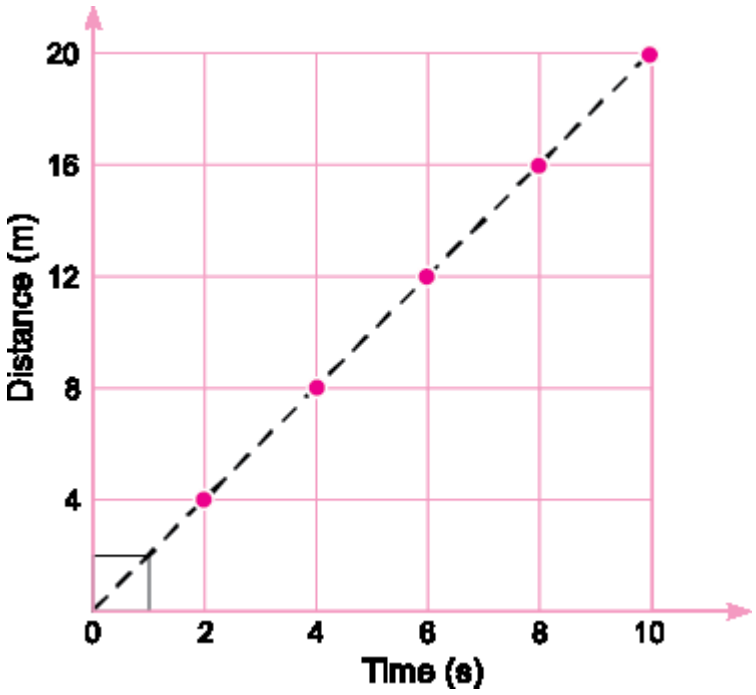
Ans. If a body covers equal distance in equal intervals of time, it is said to be in a uniform motion. For example, a car moving along a straight line. If a body covers unequal distance in equal intervals of time, it is said to be in non-uniform motion. For example, a racing horse.

Q.2. Explain with the help of an example that the states of rest and motion are relative terms.

Ans. When you are driving a car, the car is said to be in motion because it is moving relative to the road but you are said to be at rest because you are at rest relative to the moving car.

Q.3. Complete the data of the table given below with the help of the distance-time graph given in figure.

Distance (m)	0	4	?	12	?	20
Time (s)	0	2	4	?	8	10



[NCERT Exemplar]

Q.4. The average age of children of Class VII is 12 years and 3 months. Express this age in seconds.

[NCERT Exemplar]

Ans. 12 years 3 months = 12 × 365 + 3 × 30 = 4470 days

= 4470 × 24 × 60 × 60 s

= 386208000 s

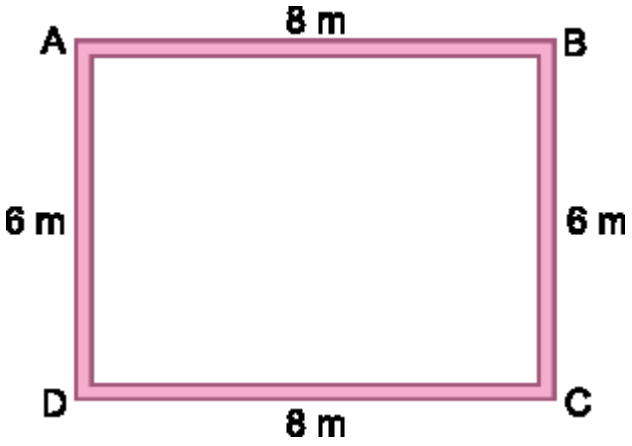
Q.4. A spaceship travels 36,000 km in one hour. Express its speed in km/s.

[NCERT Exemplar]

Ans.

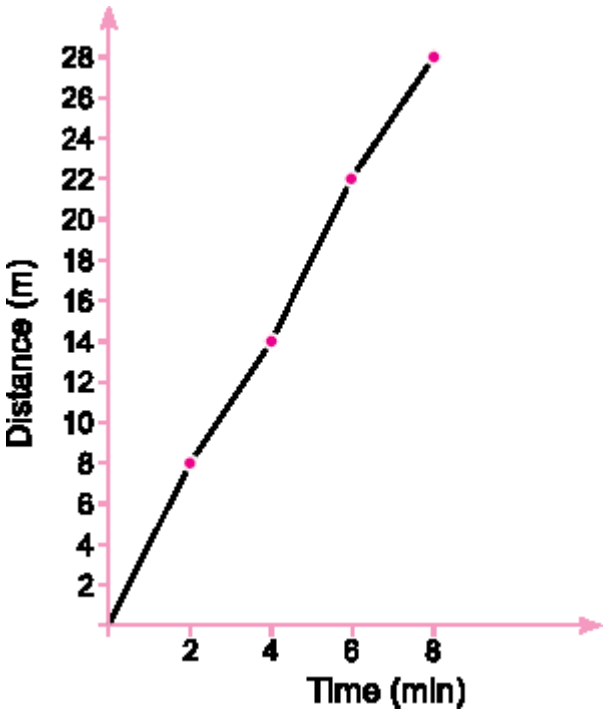
$$36{,}000 \text{ km/h} = \frac{36{,}000 \text{ km}}{60 \times 60 \text{ s}} = 10 \text{ km/s}$$

Q.6. Starting from A, Paheli moves along a rectangular path ABCD as shown in figure below. She takes 2 minutes to travel each side. Plot a distance-time graph and explain whether the motion is uniform or non-uniform.



[NCERT Exemplar]

Ans. Since the distance covered per unit time for the entire distance covered is not the same, the motion is non-uniform.

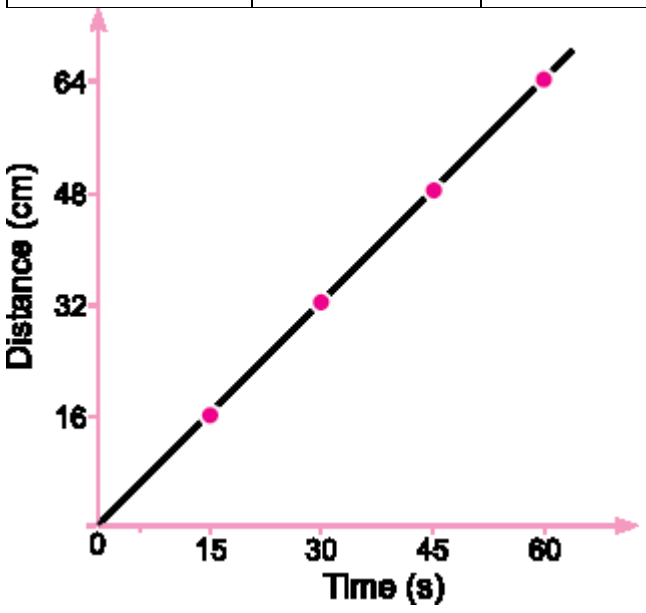


Q.7. Plot a distance-time graph of the tip of the second hand of a clock by selecting 4 points on x-axis and y-axis respectively. The circumference of the circle traced by the second hand is 64 cm.

[NCERT Exemplar]

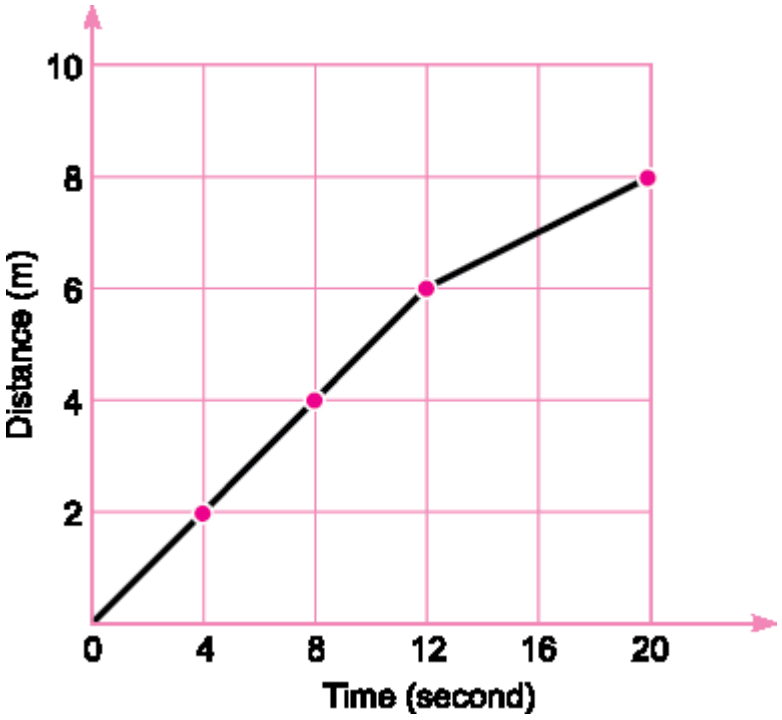
Ans.

Time (s)	x	15	30	45	60
Distance (cm)	y	16	32	48	64



Long Answer Questions

Q.1. Given below as figure is the distance-time graph of the motion of an object.



[NCERT Exemplar]

Q. What will be the position of the object at 20 s?

Ans. 8 m from the starting point.

Q. What will be the distance travelled by the object in 12 s?

Ans. 6 m

Q. What is the average speed of the object?

Ans.

$$\text{Average speed} = \frac{\text{Total distance travelled}}{\text{Total time taken}}$$

$$\frac{8\ m}{20\ s} = 0.4\ \text{m/s}$$

Q.2. Distance between Bholu's and Golu's house is 9 km. Bholu has to attend Golu's birthday party at 7 o'clock. He started from his home at 6 o'clock on his bicycle and covered a distance of 6 km in 40 minutes. At that point he met Chintu and he spoke to him for 5 minutes and reached Golu's birthday party at 7 o'clock.

With what speed did he cover the second part of the journey? Calculate his average speed for the entire journey.

[NCERT Exemplar]

Ans.

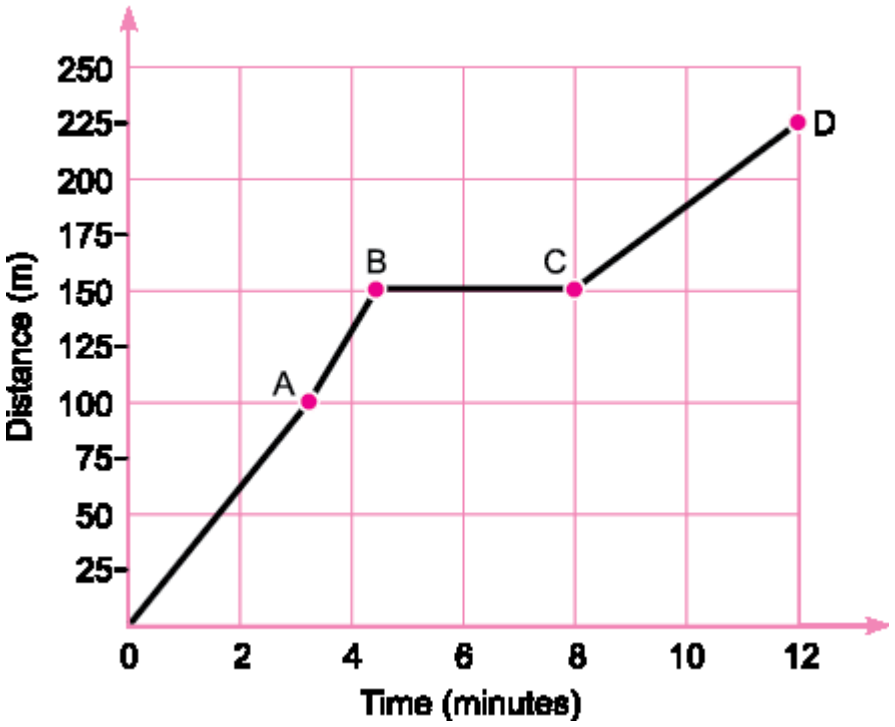
The speed with which Bholu covered the second part of the journey

$$= \frac{\text{Distance left to reach } \textit{Golu's} \text{ house}}{\text{Time left}}$$

$$= \frac{9 \text{ km} - 6 \text{ km}}{(1 \text{ hour} - 45 \textit{ min})} = \frac{3 \text{ km}}{1/4 \textit{ h}} = = 12 \text{ km/h}$$

$$\text{Average speed} = \frac{\text{Total distance travelled}}{\text{Total time taken}} = \frac{9 \text{ km}}{1 \textit{ h}} = 9 \text{ km/h}$$

Q.3. Boojho goes to the football ground to play football. The distance-time graph of his journey from his home to the ground is given in figure.



[NCERT Exemplar]

Q. What does the graph between point B and C indicate about the motion of Boojho?

Ans. Boojho is at rest, i.e., his speed is zero because the graph is constant between point B and C.

Q. Is the motion between 0 to 4 minutes uniform or non-uniform?

Ans. Non-uniform

Q. What is his speed between 8 and 12 minutes of his journey?

Ans.

$$\text{Speed} = \frac{225 - 100}{12 - 8} = \frac{75}{4} = 18.75 \text{ m/min}$$

Q.4. With the help of an activity, explain how will you measure the time period of a simple pendulum.

Ans. Activity:

- Suspend a metallic ball (bob) by a long thread from a rigid support. Your simple pendulum is ready.
- Set the simple pendulum in motion.
- Note the time in your watch when bob is at an extreme position (say A).
- When the bob again comes to the position A, count 1 (one). Each time the bob reaches this position (A), increase the count by 1 (one).
- Check the time after 25 such oscillations. Find the time taken in 25 oscillations.

HOTS (Higher Order Thinking Skills)

Q.1. A stone is dropped from a height of 20 m above the ground. Will it have a uniform or non-uniform speed, as it moves towards the ground?

Ans. A free falling body moves with a constant speed, i.e., speed of earth's gravity. Thus, the stone will have a uniform motion.