

# DISTANCE-TIME GRAPH

1 Fig. 1.1 is a distance/time graph showing the motion of an object.

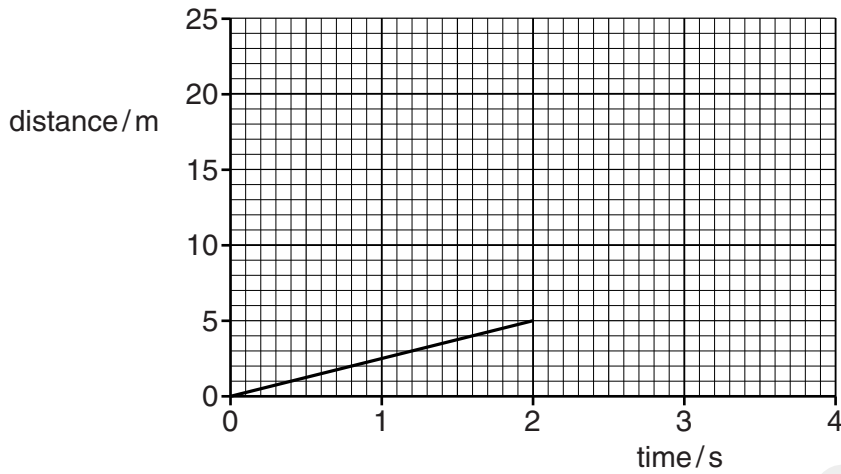


Fig. 1.1

(a) (i) Describe the motion shown for the first 2 s, calculating any relevant quantity.

.....

..... [2]

(ii) After 2 s the object accelerates.

On Fig. 1.1, sketch a possible shape of the graph for the next 2 s.

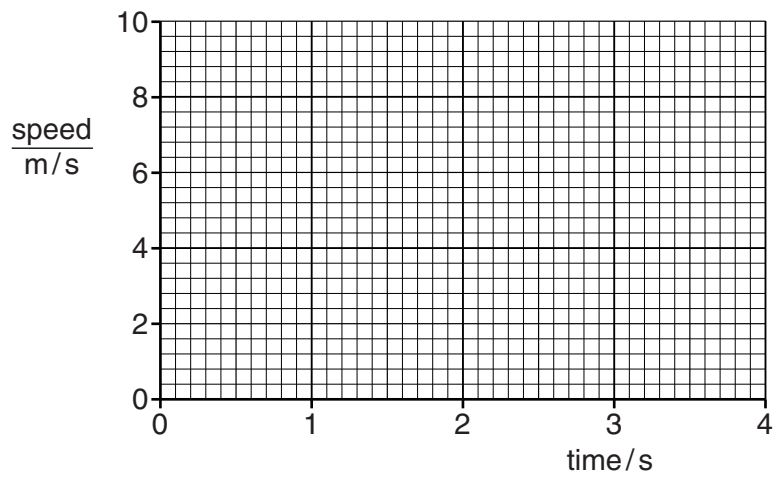
[1]

(b) Describe how a distance/time graph shows an object that is stationary.

.....

..... [1]

(c) Fig. 1.2 shows the axes for a speed/time graph.



**Fig. 1.2**

On Fig. 1.2, draw

- (i) the graph of the motion for the first 2 s as shown in Fig. 1.1,
- (ii) an extension of the graph for the next 2 s, showing the object accelerating at  $2 \text{ m/s}^2$ . [3]

(d) Describe how a speed/time graph shows an object that is stationary.

.....  
..... [2]

[Total: 9]

-----Marking Scheme-----

- (a) (i) constant/steady/uniform speed/velocity OR speed/velocity = 2.5 (m/s) B1  
 speed/velocity = 2.5 m/s accept fraction, average speed/velocity = 2.5 m/s B1 [2]
- (ii) shape curving upward but not too vertical, at least to 3.5s unless reaches 25m B1 [1]
- (b) horizontal (straight) line OR careful sketch accept parallel to time/x-axis B1 [1]
- (c) tolerance on both axes  $\pm \frac{1}{2}$  small square throughout both parts
- (i) horizontal straight line at 2.5 m/s from 0 to 2s, ecf from (a)(i) B1
- (ii) straight line rising to the right as far as the edge of the graph area  $\Delta v = 4 \text{ m/s}$  or gradient clearly  $2 \text{ m/s}^2$  M1  
 A1 [3]
- (d) horizontal (straight) line at 0 m/s M1  
 accept for both marks: line in/along time/x-axis OR line with  $y/v = 0$  OR careful sketch A1 [2]

**[Total: 9]**

2. Fig shows a distance-time graph for a moving object.

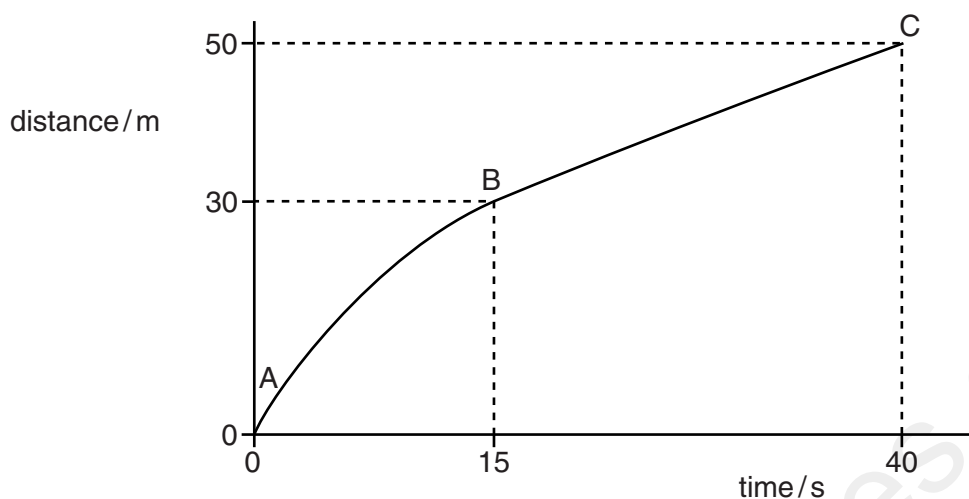


Fig. 1.1

(a) Describe the speed of the object between points

(i) A and B,

.....

(ii) B and C.

.....

[2]

(b) State whether the acceleration of the object is zero, negative or positive, as shown on the graph between points

(i) A and B,

.....

(ii) B and C.

.....

[2]

(c) Calculate the average speed of the object during the 40 seconds.

speed = ..... [2]

[Total: 6]

-----Marking Scheme-----

- (a) (i) decreases / average speed 2 m/s B1  
(ii) constant / speed 0.8 m/s B1
- (b) (i) negative B1  
(ii) zero B1
- (c) uses  $v = d/t$  in any form or  $d/t$  C1  
(av. vel =  $50/40 =$ ) 1.3 m/s or 1.25 m/s A1

**[Total: 6]**