C.E.M.TUITION

Name : _____

Review Topic : Displacement, velocity & acceleration

Time Graphs

(HSC - PAPER 2)

Year 12 - Mathematics

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For corrections refer to pages:

1 The velocity of a skier as a function of time is shown in Figure 6.1.

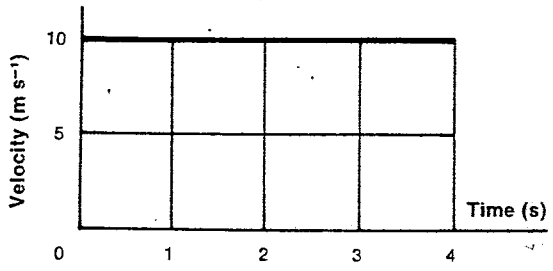

Fig. 6.1

(*a*) What was her acceleration?
(*b*) What distance did she cover in the 4 s interval?
(*c*) What distance did she travel during the *fourth* second?

1 (*a*) Zero (*b*) 40 m (*c*) 10 m

2 The velocity–time graph of a motor car is given in Figure 6.2.

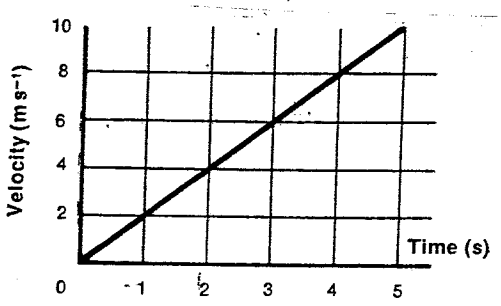

Fig. 6.2

(*a*) By how much did the velocity change in 5 s?
(*b*) What was the acceleration of the motor car?
(*c*) What was the average velocity of the car during the 5 s interval?
(*d*) How far did the car move in
  (*i*) 4 s?
  (*ii*) 5 s?
(*e*) Is the distance travelled proportional to the time taken?

2 (*a*) 10 m s^{-1} (*b*) 2 m s^{-2} (*c*) 5 m s^{-1} (*d*) (*i*) 16 m
(*ii*) 25 m (*e*) No

3 Referring to the velocity–time graph in Figure 6.3 determine

(*a*) the distance travelled by the body in the first 2 s;

(*b*) the average velocity of the body in the first 5 s;

(*c*) the instantaneous acceleration of the body after 1, 4 and 7 s respectively.

(*d*) Draw a graph of the acceleration of the body against the time.

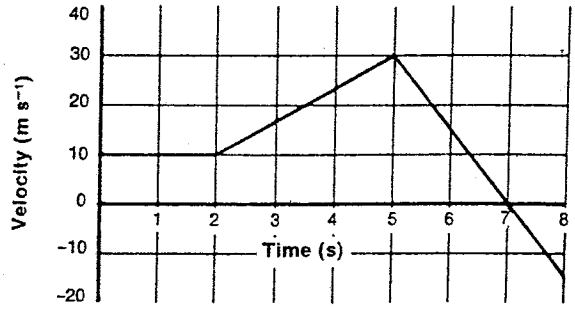

Fig. 6.3

3 (*a*) 20 m (*b*) 16 m s^{-1} (*c*) 0, 6.7 and -15 m s^{-2} respectively

4 Figure 6.4 is the velocity–time graph of a body travelling in a straight line.

(*a*) What was the displacement of the body after 4 s?
(*b*) What was its acceleration during the first second?
(*c*) What was its acceleration 4 s after starting?
(*d*) What was the magnitude of its displacement from the starting point after 10 s?

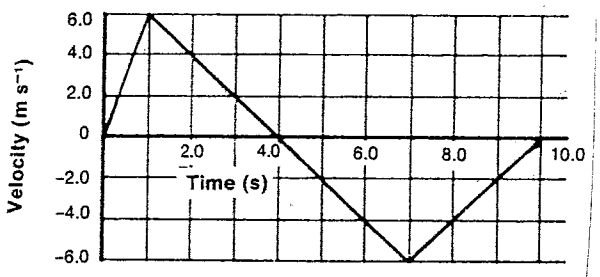

Fig. 6.4

4 (*a*) 12 m (*b*) 6.0 m s^{-2} (*c*) −2.0 m s^{-2} (*d*) 6.0 m

5 Figure 6.5 is the velocity–time graph for a train travelling north along a straight track.

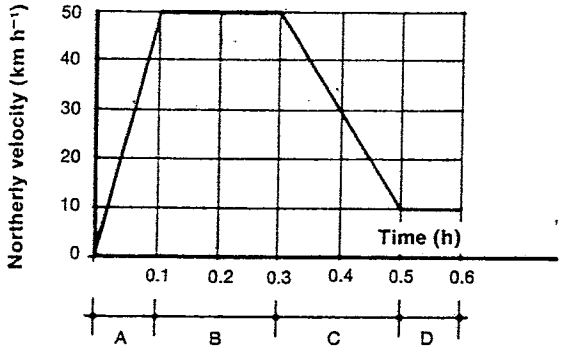

Fig. 6.5

(*a*) In which section(s) (A, B, C, D)
  (*i*) is the velocity a maximum?
  (*ii*) is the acceleration a maximum?
  (*iii*) are the velocity and acceleration constant throughout?
(*b*) What distance is travelled by the train in section C?
(*c*) What is the average speed of the train during the first 0.3 h? Give the answer to two significant figures.
(*d*) Determine the acceleration of the train at 0.4 h. Give the answer to two significant figures.

5 (*a*) (*i*) B (*ii*) A (*iii*) B and D (*b*) 6.0 km (*c*) 42 km h^{-1}
(*d*) -2.0×10^2 km h^{-2}

6 The graphs in Figures 6.6 and 6.7 describe two motions.

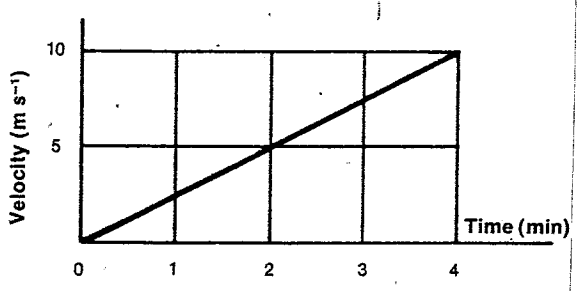

Fig. 6.6

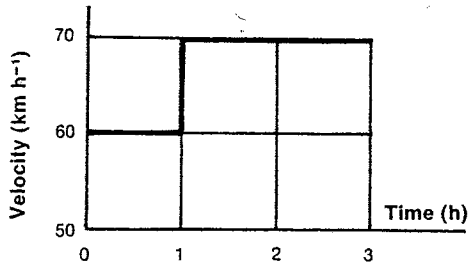

Fig. 6.7

Determine the distance covered
(*a*) in the first 4 min in Figure 6.6;
(*b*) in the first 3 h in Figure 6.7.

7 Figure 6.8 is the distance–time graph for a body.

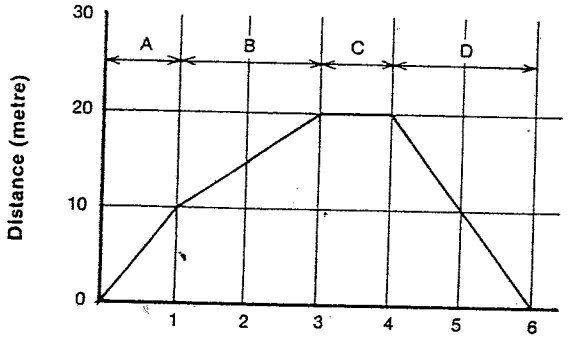

Fig. 6.8

(*a*) In which section of the motion was the body stationary?
(*b*) In which section was it moving with the least speed?
(*c*) What distance did the body travel in the first 4 min, and what was its average speed during that time?
(*d*) What is the maximum speed shown on the graph?

6 (*a*) 1.2×10^3m (*b*) 200 km
7 (*a*) C (*b*) B (*c*) 20 m; 5 m min^{-1} (*d*) 10 m min^{-1}