Year 11 HSC Physics
8.4 – Moving About
Worksheet – Displacement-Time Graphs

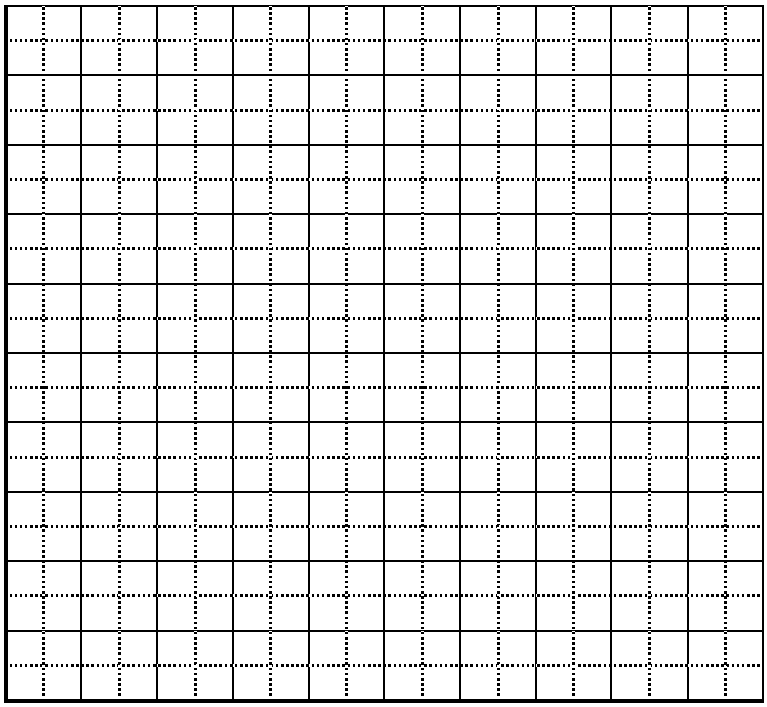
8.4.1.B

Set 1 – Drawing Displacement-Time Graphs

1. The table below shows the movement of a car as it travels along a straight road.

Time (s)	0	5	10	15	20	25	30	35	40	45	50
Displacement (m)	0	3	6	9	12	18	32	40	40	32	20

a) Graph the data on the grid below.



b) Determine the displacement at 27.0 s.

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c) Identify how long the car took to travel 13.0 m.

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d) What was the velocity at 10.0 s?

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e) Determine the velocity at 45.0 s.

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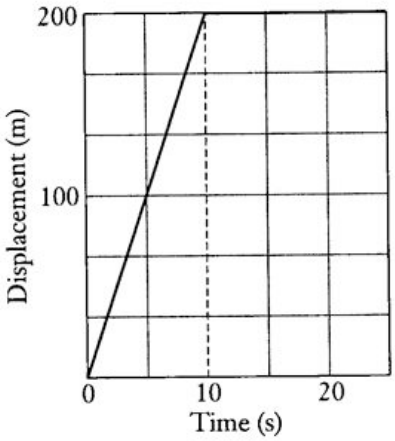
Set 2 – Interpreting Displacement-Time Graphs

2. The displacement-time graph on the right represents the motion of a car accelerating from rest in a straight line.



a) Calculate the average speed between t = 0 s and t = 10.0 s.

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b) What is the instantaneous speed at t = 20.0 s?

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c) What is the displacement between t = 0 s and t = 20.0 s?

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d) Determine the average velocity between t = 0 s and t = 20.0 s.

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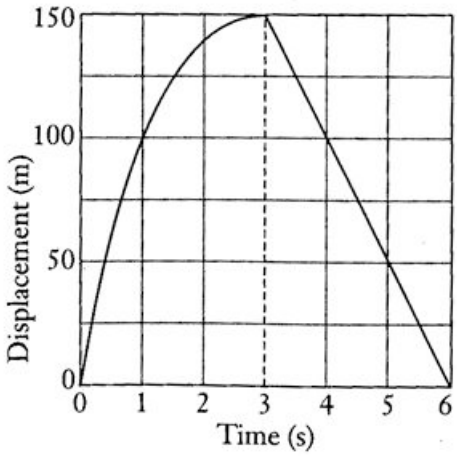
3. The displacement-time graph on the right represents the motion of a motorbike along a straight race track.



a) Determine the displacement during the first three seconds.

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b) What is the displacement over the entire six seconds of the journey?

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c) What is the distance travelled during the six seconds of the journey?

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d) Determine the instantaneous velocity at t = 2.0 s.

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e) Find the velocity at t = 5.0 s.

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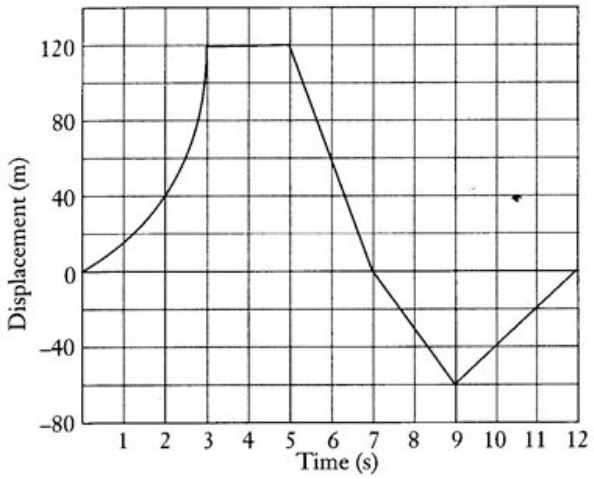
4. A dynamics cart in a physics laboratory moves in a straight line according to the displacement-time graph below.



a) Calculate the displacement between t = 0 sand t = 3.0 s.

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b) What is the speed at t = 4.0 s?

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c) Calculate the velocity at t = 1.5 s.

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d) Determine the velocity at t = 11.0 s.

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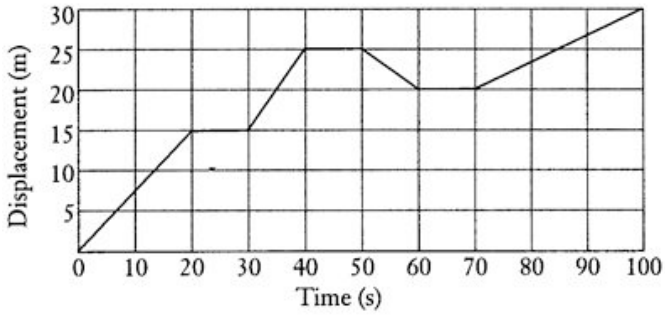
5. The position-time graph representing the motion of a person in the aisle of a supermarket is shown on the right.



a) Describe the motion represented by the graph.

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b) Identify the part of the motion where the person had the greatest speed.

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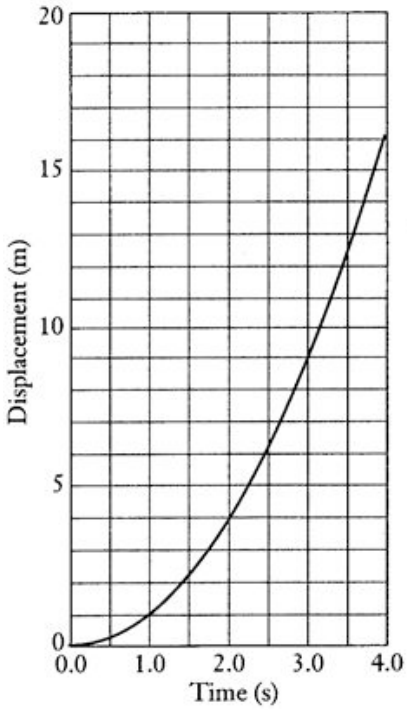
6. A distance-time graph for an insect flying in a straight line is shown on the right.



a) Determine how long it takes to travel between 5.0 and 10.0 m.

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b) Find how far it travels between 2.0 and 4.0 s.

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c) Calculate the velocity at 3.0 s.

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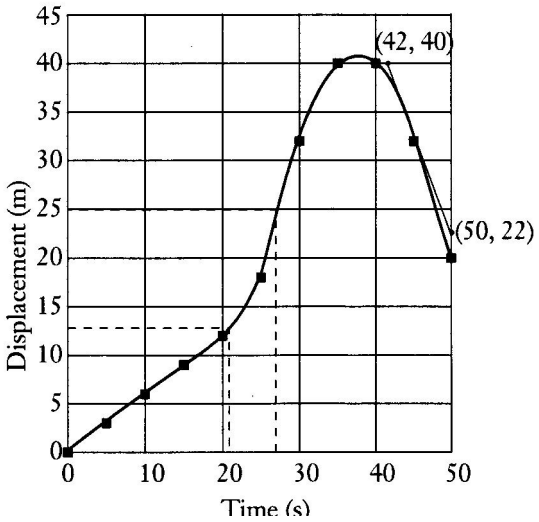
d) Convert the graph into a speed-time graph below.

Answers

Set 1 – Drawing Displacement-Time Graphs

1 a)



b) Approximately 25 m

c) Approximately 22 s

d) 0.6 ms^{-1}

e) 2.25 ms^{-1}

Set 2 – Interpreting Displacement-Time Graphs

2 a) 20 ms^{-1}

b) 0 ms^{-1}

c) 200 m

d) 10 ms^{-1}

3 a) 150 m

b) 0

c) 300 m

d) 22 ms^{-1}

e) -50 ms^{-1}

4 a) 120 m

b) 0

c) 22.2 ms^{-1}

d) 20.0 ms^{-1}

5 a) Between 0 and 20 s they travelled at 0.75 ms^{-1} for 15 m. During 20 and 30 s they were stationary. Between 30 and 40 s they travelled in the forward direction at 1.0 ms^{-1} for 10 m. For the next 10s they were stationary again. Between 50 and 60 seconds they travelled backwards at a speed of 0.5 ms^{-1} and then remained stationary for another 10 s. During 70 to 100 s they travelled again in the forward direction for 10 at a speed of 0.5 ms^{-1}.

b) The greatest speed was 1.0 ms^{-1} between 30 and 40 s

6 a) 0.95 s

b) 12 m

c) 6 ms^{-1}

d)