

# PHYSICS

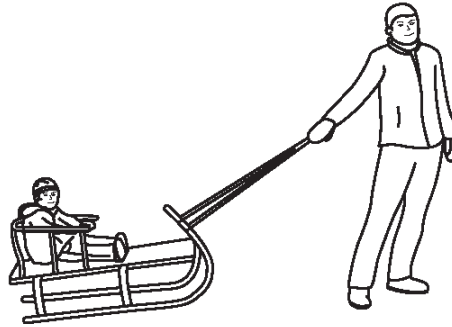
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1- (4PH0-S 2015-Paper 1PR-Q7)-MOVEMENT AND POSITION, FORCES AND MOVEMENT

The diagram shows a man pulling a child on a sledge.



(a) The acceleration of the sledge is  $1.5 \text{ m/s}^2$ .

The mass of the child and sledge is  $38 \text{ kg}$ .

(i) State the equation linking force, mass and acceleration.

(1)

(ii) Calculate the force needed to produce this acceleration.

(2)

force = ..... N

(iii) Suggest a reason why the force exerted on the sledge by the man must be greater than the force calculated.

(1)

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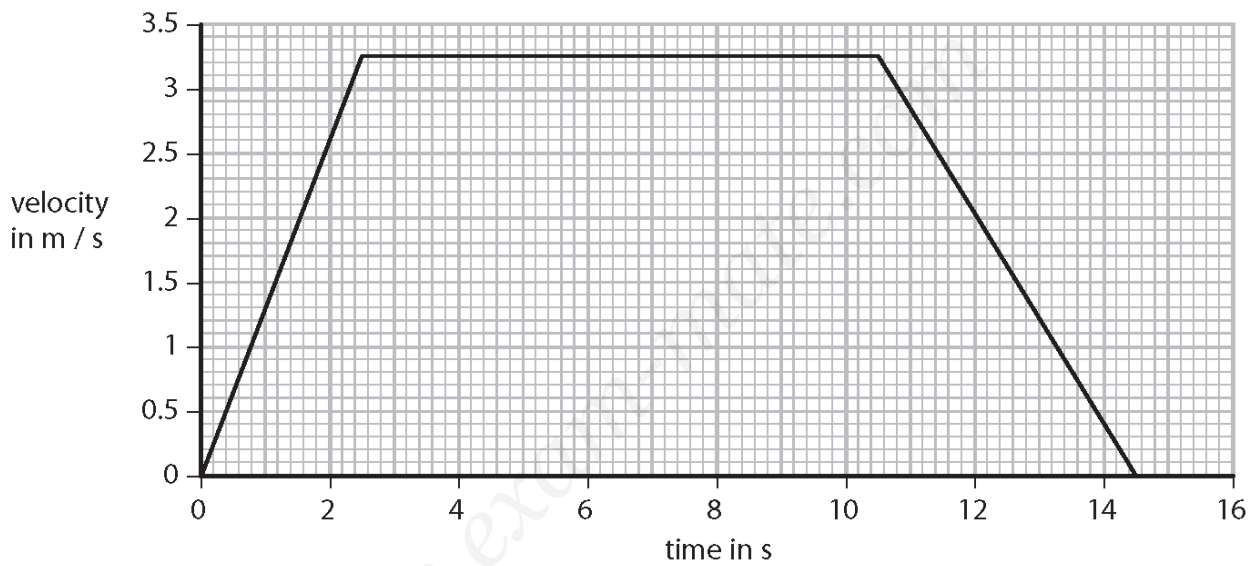
1- (4PH0-S 2015-Paper 1PR-Q7)-MOVEMENT AND POSITION, FORCES AND MOVEMENT

(b) The sledge starts from rest and accelerates at  $1.5 \text{ m/s}^2$  until its velocity is  $2.8 \text{ m/s}$ .

(i) State the relationship between acceleration, velocity and time. (1)

(ii) Show that the time taken to reach  $2.8 \text{ m/s}$  is about  $2 \text{ s}$ . (2)

(c) This velocity-time graph shows the motion of the sledge as it travels down a hill.



(i) Calculate the distance travelled by the sledge. (3)

distance travelled = ..... m

(ii) State the equation linking average speed, distance moved and time taken.

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1- (4PH0-S 2015-Paper 1PR-Q7)-MOVEMENT AND POSITION, FORCES AND MOVEMENT

(iii) Calculate the average speed of the sledge for the whole journey.

(2)

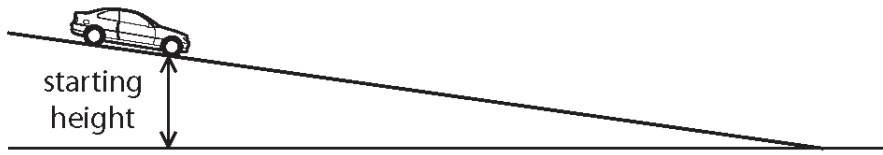
average speed = .....m/s

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2- (4PH0-S 2015-Paper 1PR-Q5)-MOVEMENT AND POSITION

A student investigates the speed of different toy cars as they roll down a slope.



(a) The student makes this prediction.

'The more weight a toy car has the faster it will roll down the slope.'

(i) What is the independent variable in the student's prediction?

(1)

.....

(ii) What is the dependent variable in the student's prediction?

(1)

.....

(b) State two factors that the student should keep constant in his investigation.

(2)

1 .....

.....

2 .....

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## 2- (4PH0-S 2015-Paper 1PR-Q5)-MOVEMENT AND POSITION

- (c) Put ticks (✓) in the boxes to show which pieces of apparatus the student needs for his investigation.

One has been done for you.

(2)

battery	
joulemeter	
micrometer	
newtonmeter	
ruler	✓
stopwatch	
thermometer	

- (d) Describe what the student should do to test his prediction that the more weight the toy car has, the faster it will roll down the slope.

(5)

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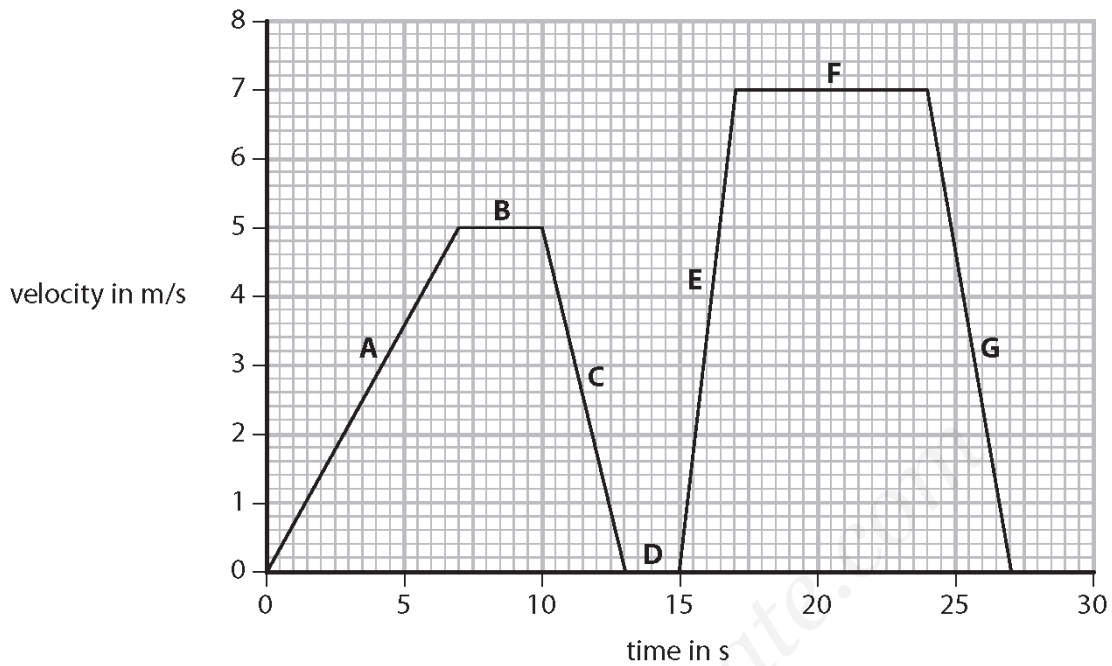
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3- (4PH0-S 2013-Paper 1PR-Q5)-MOVEMENT AND POSITION

A student cycles to school.

The graph shows the stages A to G of the journey.



(a) Describe the motion of the student during stages B and D.

(2)

Stage	Description
B	
D	

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3- (4PH0-S 2013-Paper 1PR-Q5)-MOVEMENT AND POSITION

(b) State how the graph shows that the acceleration for stage E is greater than the acceleration for stage A.

(1)

.....

.....

.....

(c) Calculate the distance that the student travels in the last 10 s of the journey.

(4)

distance = ..... m

(d) The total distance travelled is 106.5 m.

Show that the average speed of the journey is about 4 m/s.

(3)

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