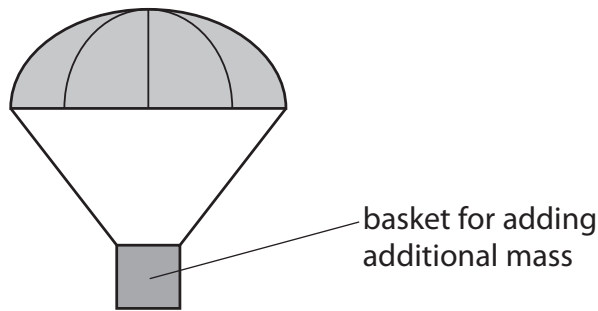


- 6 A student investigates the motion of different falling masses by measuring the time taken for a toy parachute to fall from a window.



This is the student's method.

- measure the mass of the toy parachute
 - drop the toy parachute from the window
 - repeat the experiment with additional mass added to the toy parachute
 - continue to add mass up to a maximum of six different masses
- (a) Describe how the student should measure the time taken for the toy parachute to fall from the window.

(2)

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- (b) State the independent and dependent variables in this investigation.

(2)

independent variable

dependent variable

- (c) State one factor that the student should keep constant in order to make his investigation valid (a fair test).

(1)

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(d) The table shows the student's results.

Mass in g	Time taken in s			
	Trial 1	Trial 2	Trial 3	Average (mean)
20	1.72	1.67	1.65	1.68
40	1.23	1.30	1.25	1.26
60	1.11	1.16	1.06	1.11
80	0.99	0.97	1.01	0.99
100	0.95	0.92	0.92	0.93
120	0.90	0.88	0.85	

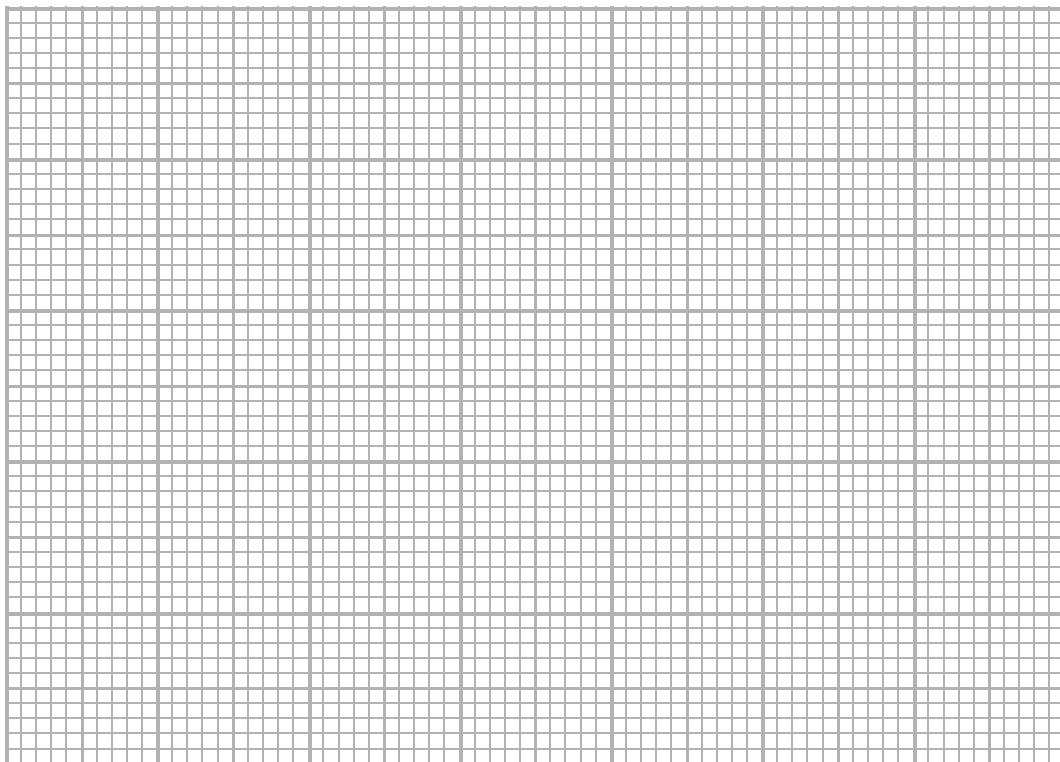
(i) Complete the table by calculating the average time for a mass of 120 g.

(2)



(ii) On the grid, plot a graph of the average time taken for each mass.

(4)



(iii) Draw the curve of best fit.

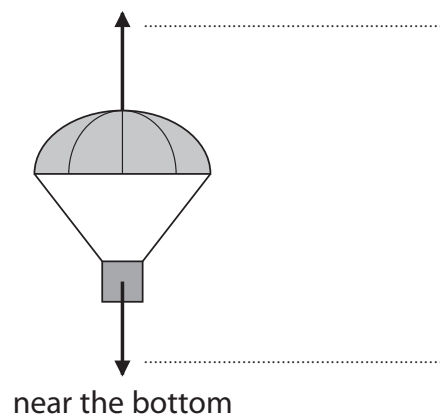
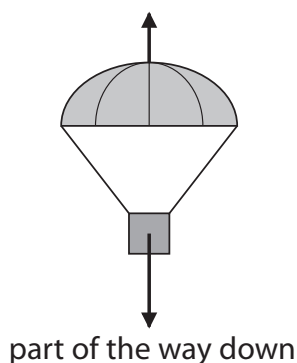
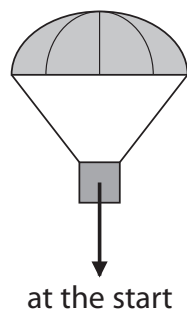
(1)



- (e) The student notices that the toy parachute accelerates and then falls at constant speed.
- (i) The arrows in the diagrams show the size and direction of the forces acting on the toy parachute at different points during its fall.

Label the forces on the last diagram.

(2)



- (ii) Explain why the toy parachute accelerates and then falls at a constant speed.

(3)

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(Total for Question 6 = 17 marks)

