11 A steel ball is fired from a launcher on an adjustable table.
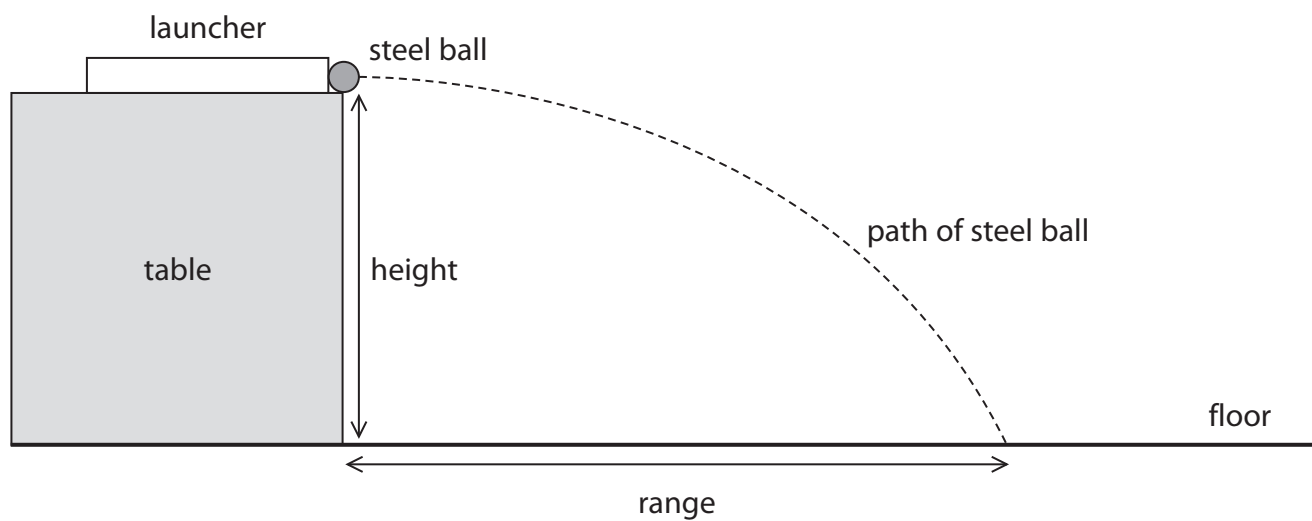
A student investigates how the range of the steel ball varies with the height of the table.

(a) Describe a method for the student's investigation.

Your answer should include details of

- the variables in the investigation
- how the investigation will be valid (a fair test)
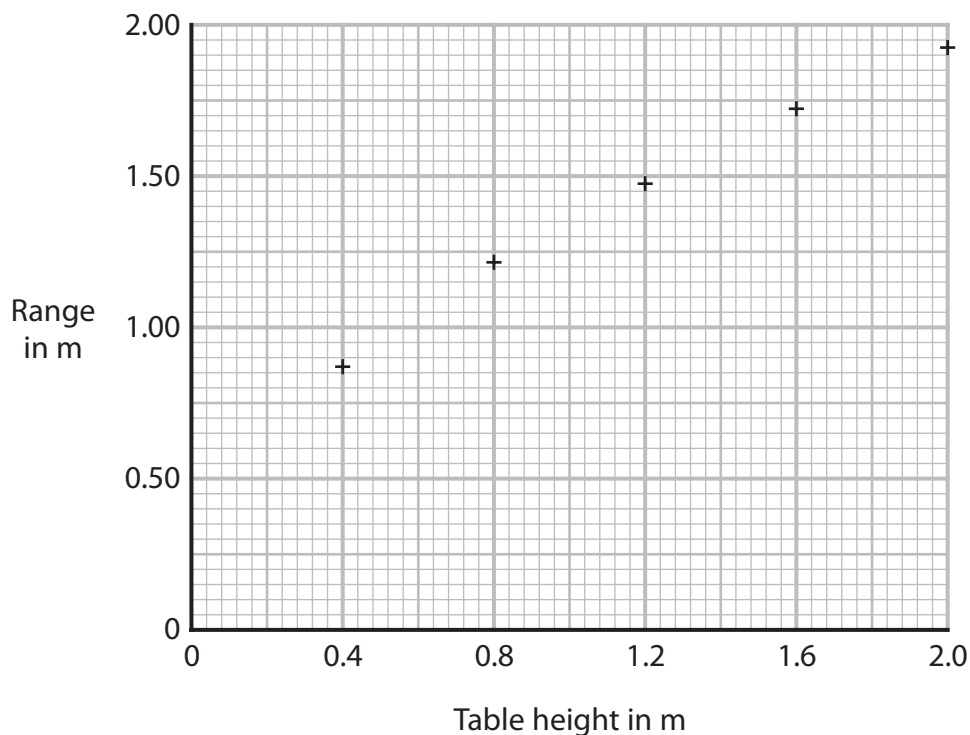- how the range will be measured accurately

(6)

P 7 0 9 5 1 A 0 2 7 3 2

(b) The graph shows the student's results.

(i) Draw the curve of best fit.

(1)

(ii) Estimate what the height of the table would be when the range of the projectile is 0.60 m.

(1)

height = ... m

(iii) Justify why the student has plotted a line graph rather than a bar chart.

(1)

....

....

....

(iv) The range of the projectile is related to the table height by this formula

$$range = launch\ speed \times \sqrt{\frac{table\ height}{5}}$$

Using data from the graph, show that the launch speed of the projectile is approximately 3 m / s.

(4)

launch speed = ... m / s

(Total for Question 11 = 13 marks)