3 A student has been asked to determine the linear acceleration of a toy car as it moves down a slope. He sets up the apparatus as shown in Fig. 3.1.

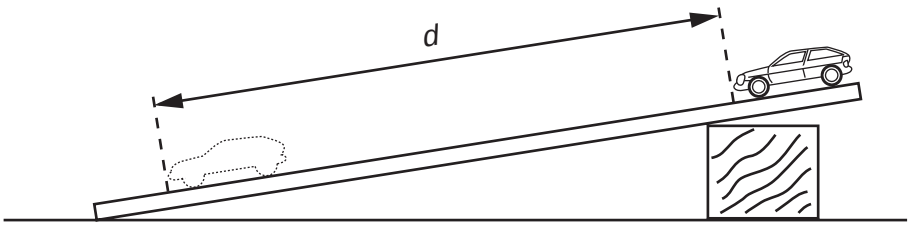

Fig. 3.1

The time t to move from rest through a distance d is found for different values of d. A graph of d (y-axis) is plotted against t^2 (x-axis) as shown in Fig. 3.2.

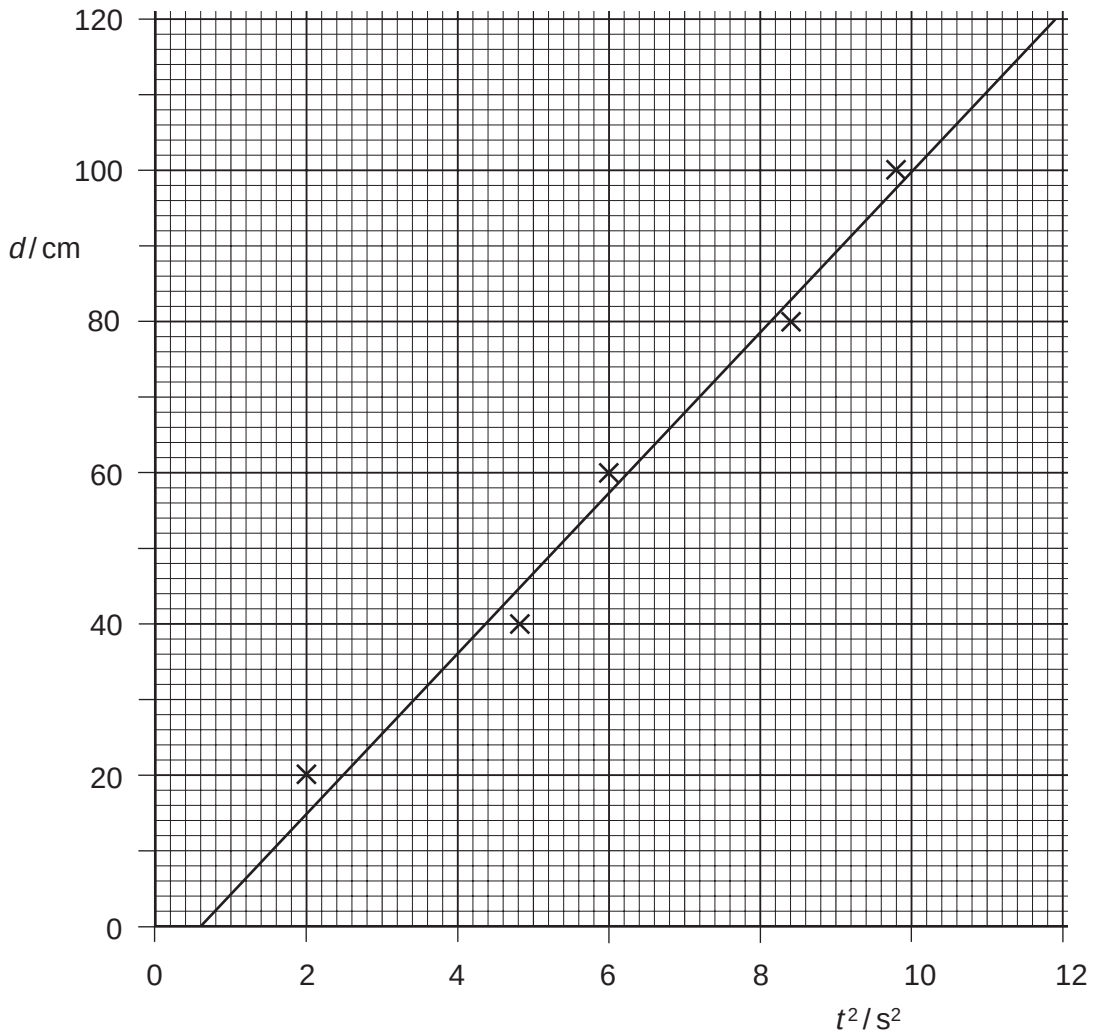

Fig. 3.2

(a) Theory suggests that the graph is a straight line through the origin.
Name the feature on Fig. 3.2 that indicates the presence of

(i) random error,

.....

(ii) systematic error.

.....
[2]

(b) **(i)** Determine the gradient of the line of the graph in Fig. 3.2.

gradient = ... [2]

(ii) Use your answer to **(i)** to calculate the acceleration of the toy down the slope.
Explain your working.

acceleration = ... $m\,s^{-2}$ [3]