2 A student investigates the speed of a trolley as it rolls down a slope, as illustrated in Fig. 2.1.

For Examiner's Use

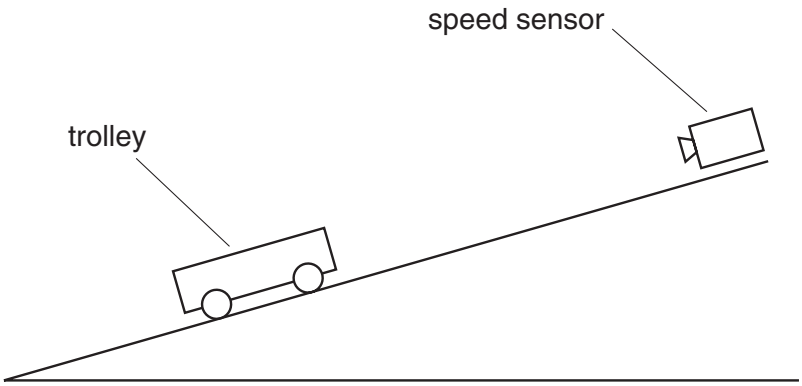

Fig. 2.1

The speed v of the trolley is measured using a speed sensor for different values of the time t that the trolley has moved from rest down the slope.

Fig. 2.2 shows the variation with t of v.

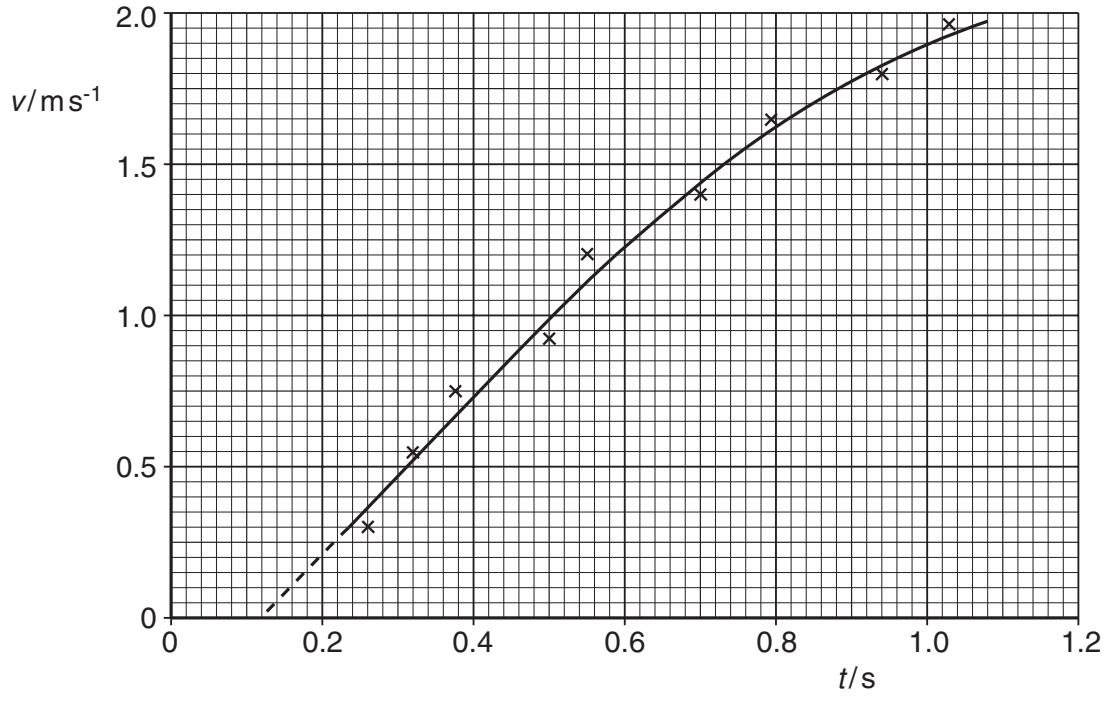

Fig. 2.2

(a) Use Fig. 2.2 to determine the acceleration of the trolley at the point on the graph where $t = 0.80$ s.

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acceleration = ... $m\,s^{-2}$ [4]

(b) **(i)** State whether the acceleration is increasing or decreasing for values of t greater than 0.6 s. Justify your answer by reference to Fig. 2.2.

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..... [2]

(ii) Suggest an explanation for this change in acceleration.

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..... [1]

(c) Name the feature of Fig. 2.2 that indicates the presence of

(i) random error,

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..... [1]

(ii) systematic error.

.....

..... [1]

[Turn over