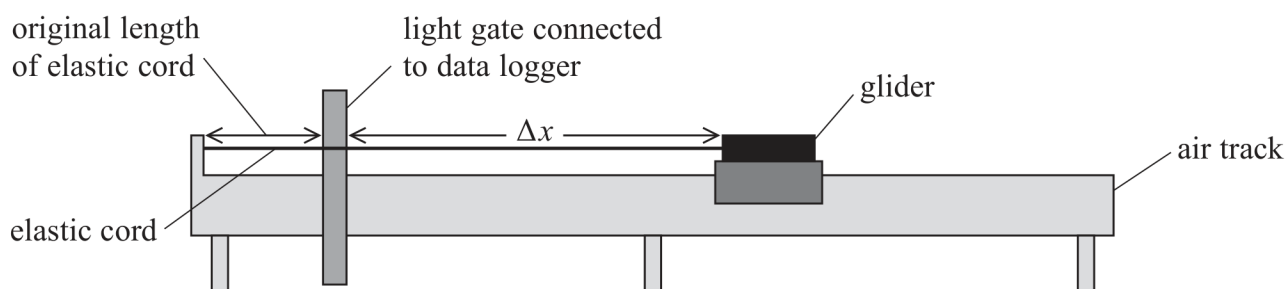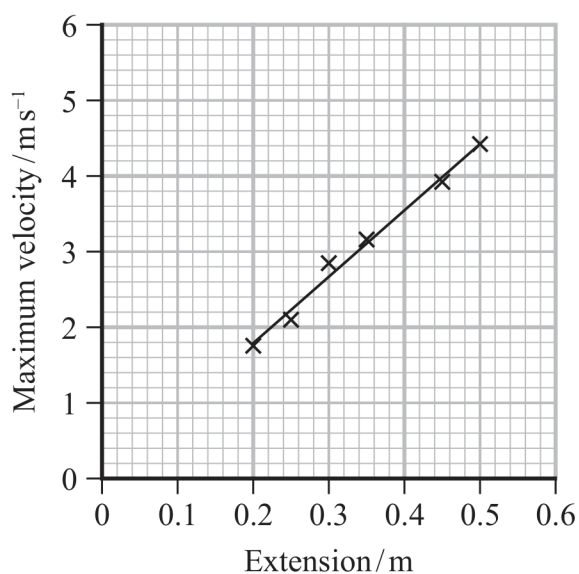**17** An elastic cord was fixed between the end of an air track and a glider.
The glider was pulled to the right, giving the elastic cord an extension Δx as shown.

The glider was released, and it moved to the left. A light gate was used to measure the maximum velocity of the glider. This was repeated for different values of Δx.

A student obtained the following results.

(a) The principle of conservation of energy predicts that the graph should be a straight line through the origin. For the range of values of Δx used, the elastic cord obeyed Hooke's law.

(i) Explain this prediction.

(4)

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(ii) Determine the stiffness k of the elastic cord.

mass of glider = 300 g

(3)

$k =$ ....

(b) When the glider was moved to the right by more than 0.5 m, the graph began to curve.

Explain why the shape of the graph changed.

(2)

(Total for Question 17 = 9 marks)