



- 3 The tension in a sample of wire varies with extension as shown in Fig. 3.1.

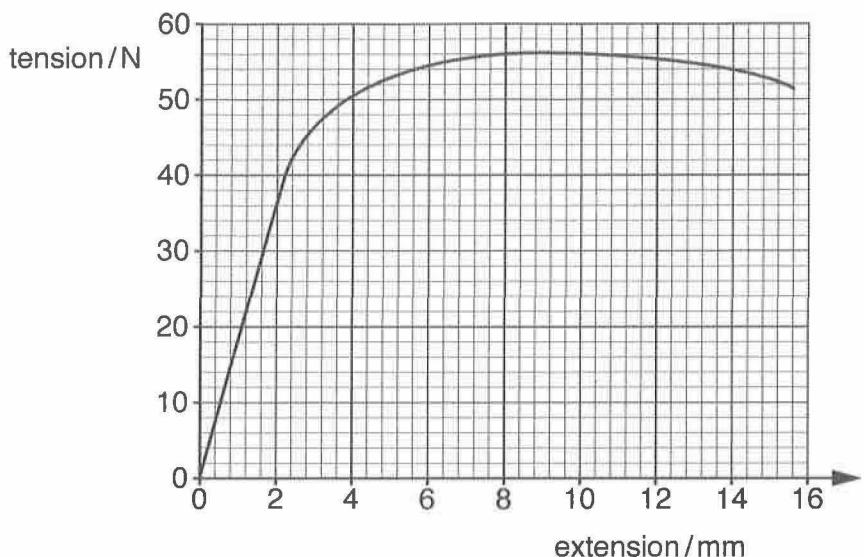


Fig. 3.1

The graph shows that the wire undergoes two types of deformation as it is extended to 15.6 mm.

In the region of the graph where Hooke's law applies, the deformation is *elastic* and the wire will lose this deformation when the tension is released.

In the region of the graph where Hooke's law does **not** apply the deformation is *plastic* and the wire retains this deformation when the tension is released.

- (a) Use the graph to estimate the total work done on the wire.

$$\text{work done} = \dots \text{J} [4]$$



(b) The tension is then decreased to zero.

(i) On Fig. 3.1, draw a straight line from the extension of 15.6 mm to show how the extension will change as the tension is now decreased. [1]

(ii) Determine how much elastic potential energy is released as the tension decreases.

released elastic potential energy = J [2]

(c) Explain how the law of conservation of energy applies in this situation.

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[2]

[Total: 9]

