

- 3 The vibrations of a mass of 150 g are simple harmonic. Fig. 3.1 shows the variation with displacement x of the kinetic energy E_k of the mass.

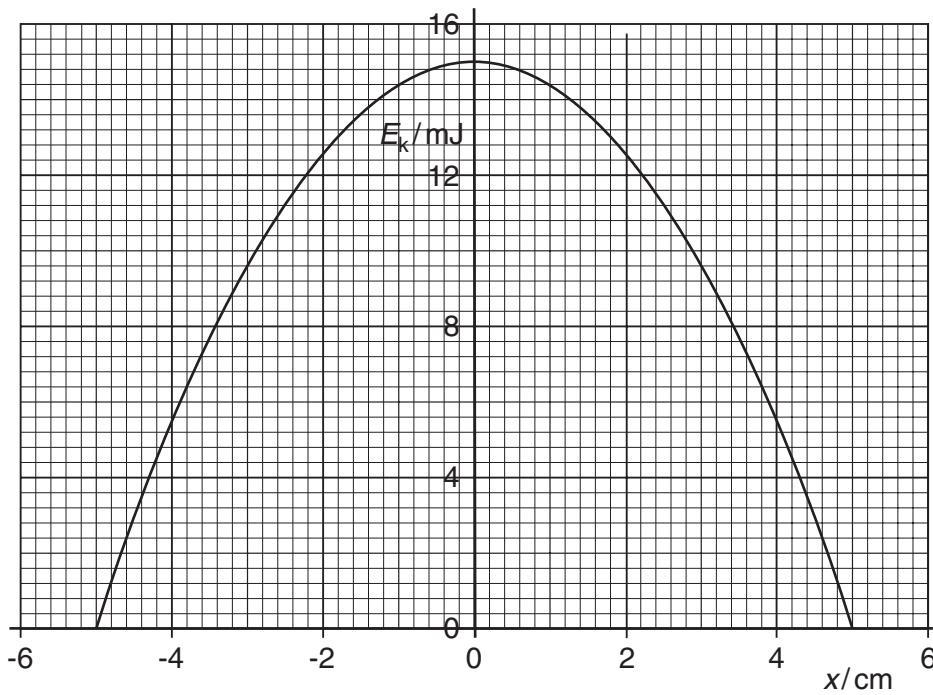


Fig. 3.1

- (a) On Fig. 3.1, draw lines to represent the variation with displacement x of

- the potential energy of the vibrating mass (label this line P),
- the total energy of the vibrations (label this line T).

[2]

- (b) Calculate the angular frequency of the vibrations of the mass.

$$\text{angular frequency} = \dots \text{rad s}^{-1} \quad [3]$$

(c) The oscillations are now subject to damping.

(i) Explain what is meant by *damping*.

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[2]

(ii) The mass loses 20% of its vibrational energy. Use Fig. 3.1 to determine the new amplitude of oscillation. Explain your working.

amplitude = cm [2]