

- 4 A student investigates the energy changes of a mass oscillating on a vertical spring, as shown in Fig. 4.1.

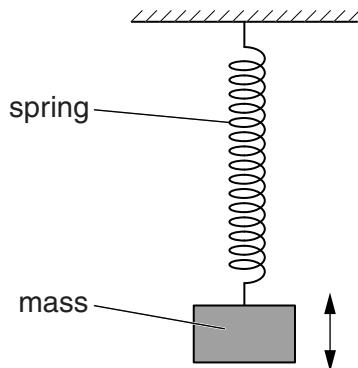


Fig. 4.1

The student draws a graph of the variation with displacement  $x$  of energy  $E$  of the oscillation, as shown in Fig. 4.2.

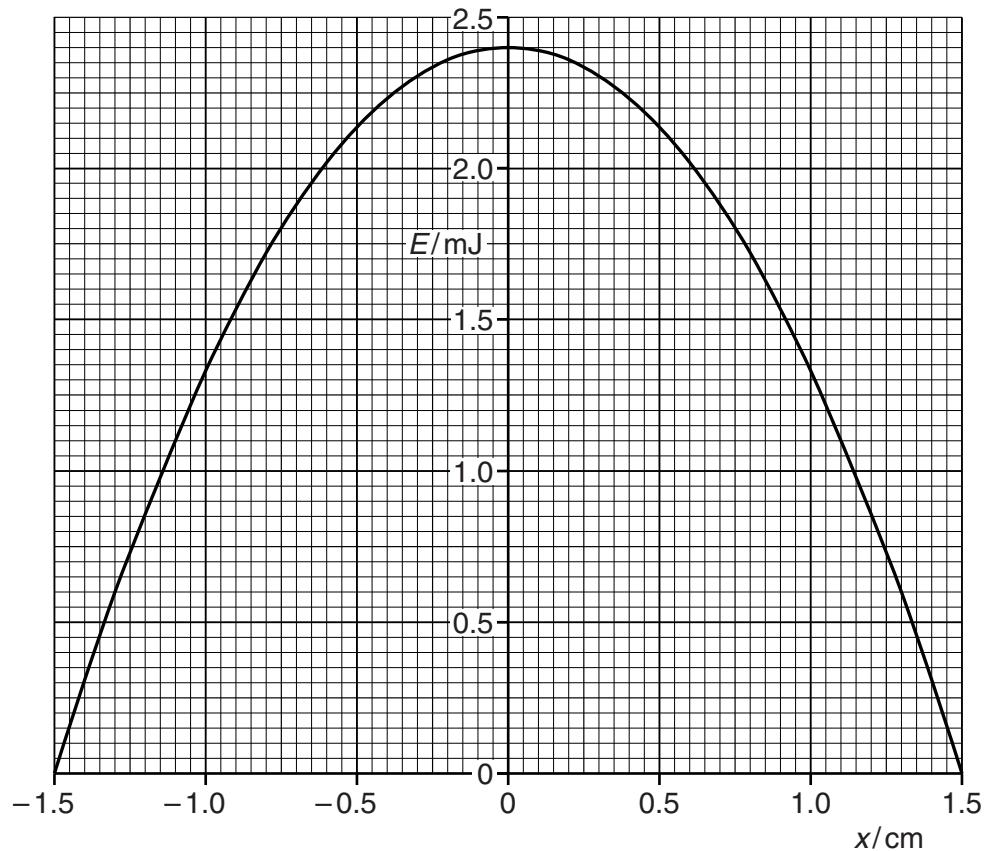


Fig. 4.2

- (a) State whether the energy  $E$  represents the total energy, the potential energy or the kinetic energy of the oscillations.

..... [1]

- (b)** The student repeats the investigation but with a smaller amplitude. The maximum value of  $E$  is now found to be 1.8 mJ.

Use Fig. 4.2 to determine the change in the amplitude. Explain your working.

change in amplitude = ..... cm [3]