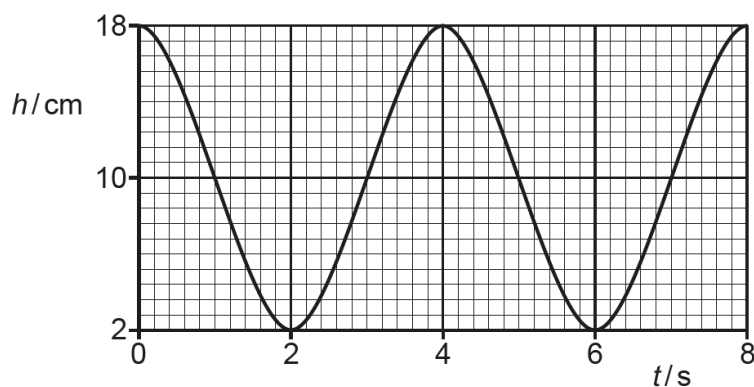


- 4 Fig. 4.1 shows the variation with time  $t$  of the height  $h$  above the ground of an object of mass 36 kg that is undergoing vertical simple harmonic motion.



**Fig. 4.1**

- (a) State the defining equation for simple harmonic motion. Identify the meaning of each of the symbols used to represent physical quantities.

.....

.....

.....[1]

- (b) For the oscillations of the object,

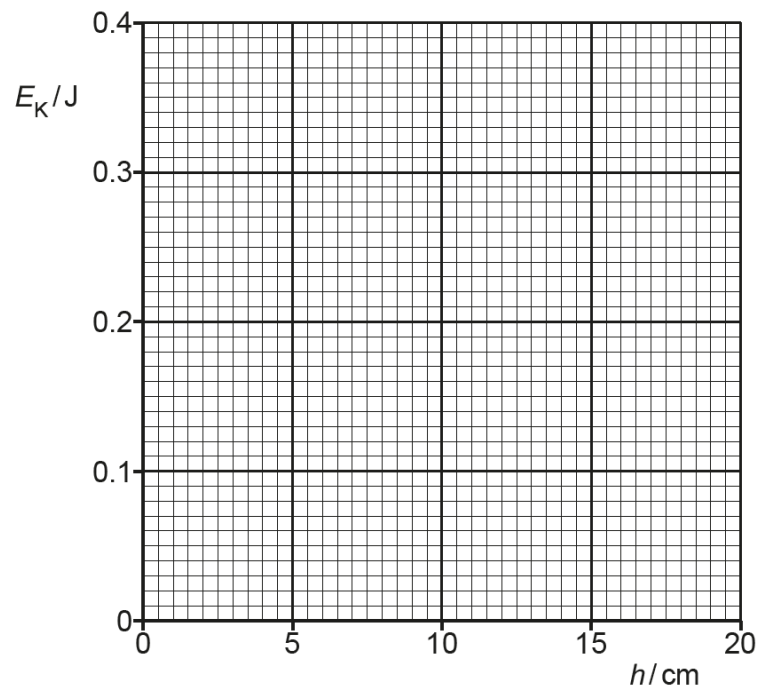
- (i) show that the angular frequency  $\omega$  is  $1.6 \text{ rad s}^{-1}$ ,

[1]

(ii) determine the total energy  $E$ .

$E = \dots\dots\dots$  J [3]

(c) On Fig. 4.2, sketch the variation with  $h$  of the kinetic energy  $E_K$  of the object.



**Fig. 4.2**

[3]

[Total: 8]

