

5 (a) State what is meant by simple harmonic motion.

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.....

..... [2]

(b) A block is suspended by a spring. The block oscillates vertically with simple harmonic motion.

The velocity v of the block varies with time t according to

$$v = 0.56 \cos 16t$$

where v is in ms^{-1} and t is in s.

(i) Calculate the period of the oscillation.

period = s [1]

(ii) Determine the amplitude x_0 of the oscillation.

$x_0 =$ m [2]

(iii) Use your answer in (b)(ii) to determine the equation for v in terms of the displacement x of the block, where v is in ms^{-1} and x is in m.

$v =$ [1]

(iv) On Fig. 5.1, sketch the variation of v with x .

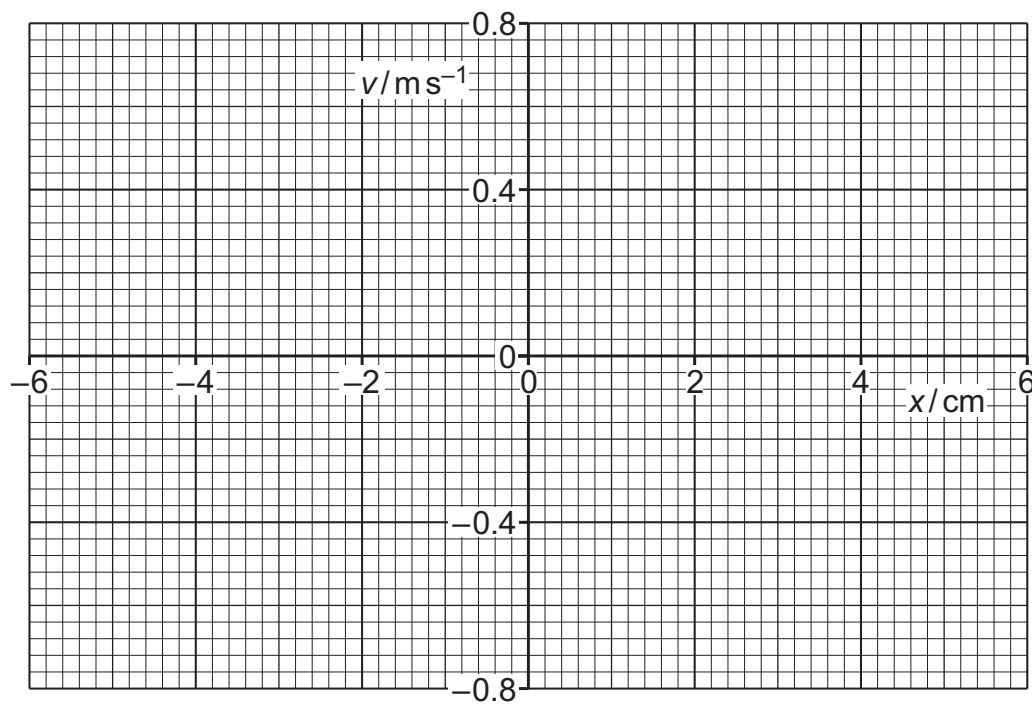


Fig. 5.1

[3]

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