

5 (a) A source of sound has frequency f . Sound of wavelength λ is produced by the source.

(i) State

1. what is meant by the *frequency* of the source,

.....
.....[1]

2. the distance moved, in terms of λ , by a wavefront during n oscillations of the source.

distance =[1]

(ii) Use your answers in (i) to deduce an expression for the speed v of the wave in terms of f and λ .

[2]

(b) The waveform of a sound wave produced on the screen of a cathode-ray oscilloscope (c.r.o.) is shown in Fig. 5.1.

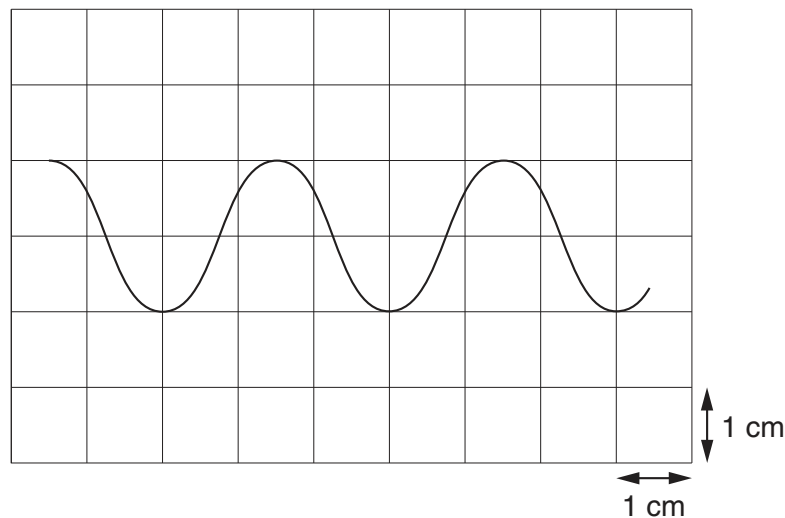


Fig. 5.1

The time-base setting of the c.r.o. is 2.0 ms cm^{-1} .

For
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Use

- (i) Determine the frequency of the sound wave.

frequency =Hz [2]

- (ii) A second sound wave has the same frequency as that calculated in (i). The amplitude of the two waves is the same but the phase difference between them is 90° .

On Fig. 5.1, draw the waveform of this second wave. [1]