5 A stationary loudspeaker emits sound of constant frequency. A microphone is placed near to the loudspeaker and connected to a cathode-ray oscilloscope (CRO). The trace on the screen of the CRO is shown in Fig. 5.1.

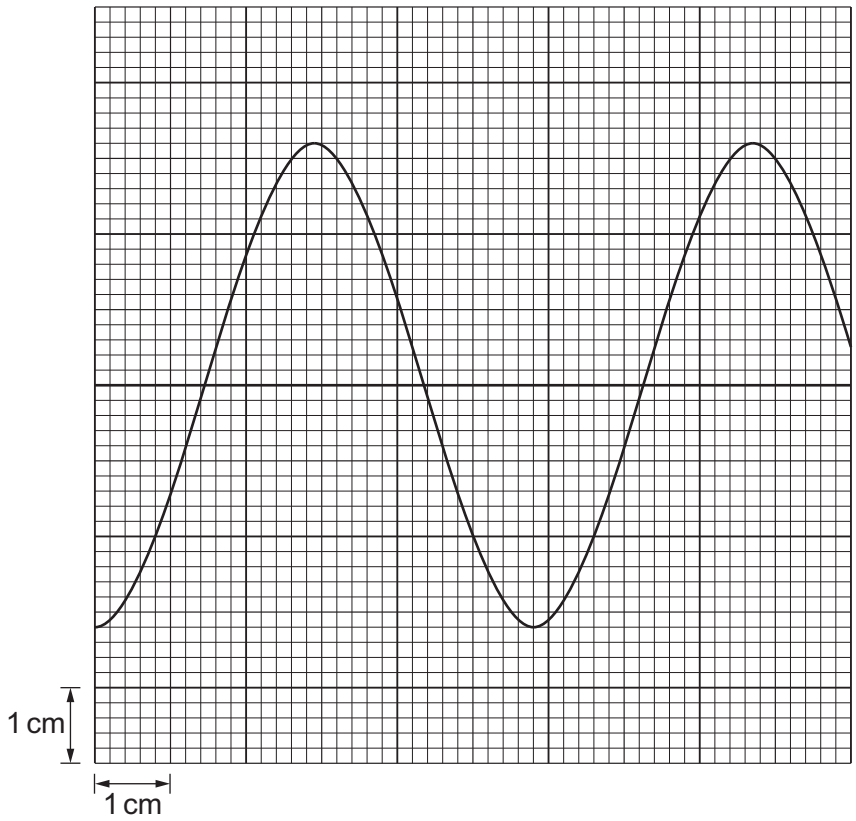

Fig. 5.1

The time-base of the CRO is set to $5.0 \times 10^{-4}\,\text{s}\,\text{cm}^{-1}$.

(a) The speed of the sound emitted by the loudspeaker is $330\,\text{m}\,\text{s}^{-1}$.

Determine the wavelength of the sound.

wavelength = ... m [3]

(b) The loudspeaker now moves in a straight line while emitting the same sound of constant frequency. The period of the trace on the CRO increases continuously.

Describe the motion of the loudspeaker.

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..... [2]

[Total: 5]