

- 6 (a) State the *principle of superposition*.

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- (b) An arrangement that can be used to determine the speed of sound in air is shown in Fig. 6.1.

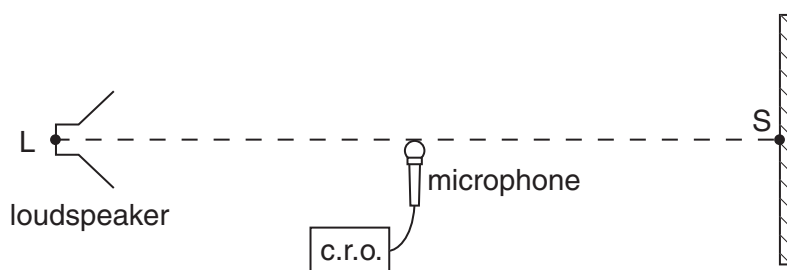


Fig. 6.1

Sound waves of constant frequency are emitted from the loudspeaker L and are reflected from a point S on a hard surface.  
The loudspeaker is moved away from S until a stationary wave is produced.

Explain how sound waves from L give rise to a stationary wave between L and S.

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- (c) A microphone connected to a cathode ray oscilloscope (c.r.o.) is positioned between L and S as shown in Fig. 6.1. The trace obtained on the c.r.o. is shown in Fig. 6.2.

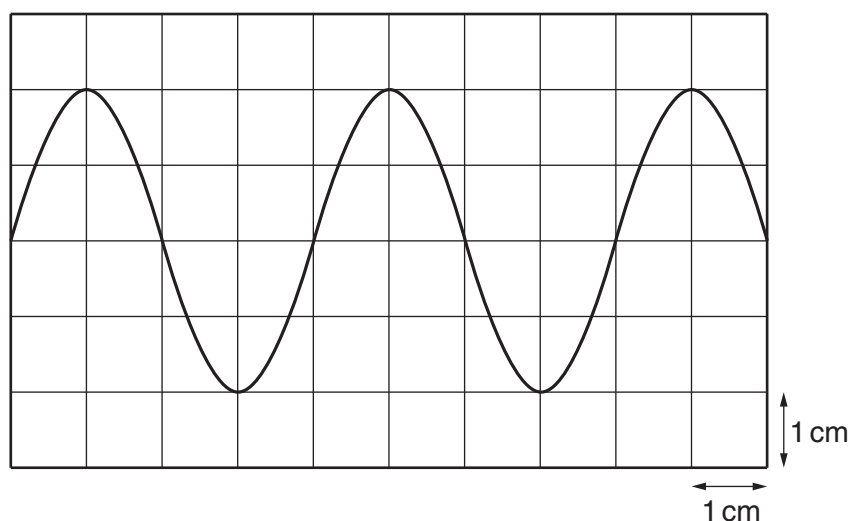


Fig. 6.2

The time-base setting on the c.r.o. is  $0.10 \text{ ms cm}^{-1}$ .