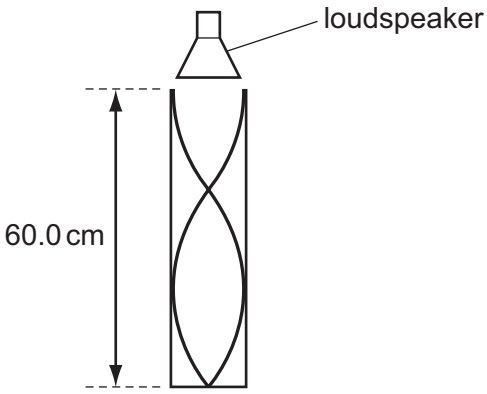
27 The sound from a loudspeaker placed above a tube causes resonance of the air in the tube.

A stationary wave is formed with two nodes and two antinodes as shown.

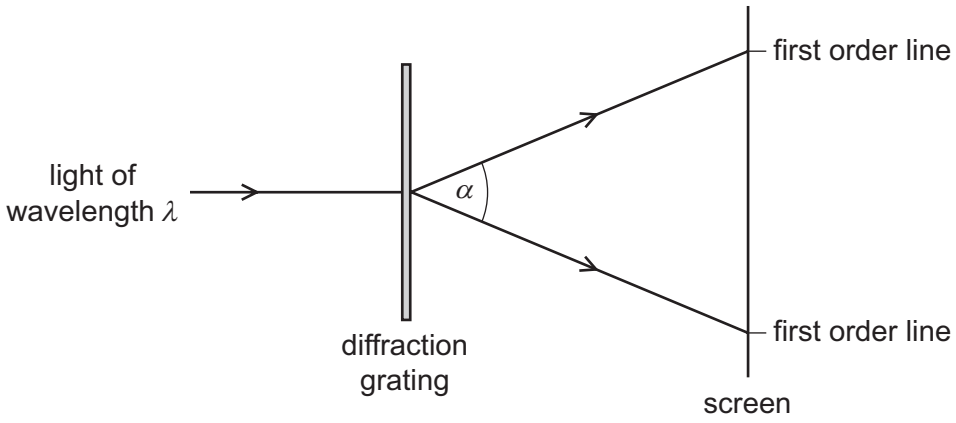


The speed of sound in air is $330\,\text{m}\,\text{s}^{-1}$.

What is the frequency of the sound?

A 413 Hz **B** 550 Hz **C** 830 Hz **D** 1650 Hz

28 Light of wavelength λ passes through a diffraction grating with slit spacing d. A series of lines is observed on a screen.



What is the angle α between the two first order lines?

A $\sin^{-1}\left(\frac{\lambda}{2d}\right)$ **B** $\sin^{-1}\left(\frac{\lambda}{d}\right)$ **C** $2\sin^{-1}\left(\frac{\lambda}{2d}\right)$ **D** $2\sin^{-1}\left(\frac{\lambda}{d}\right)$

Space for working