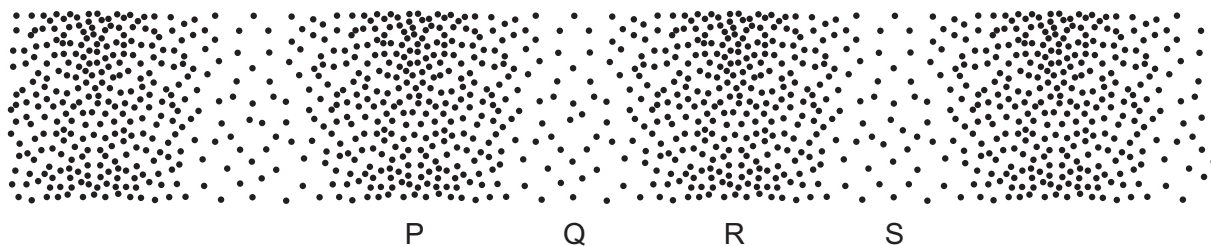


- 22 A sound wave passes through air.

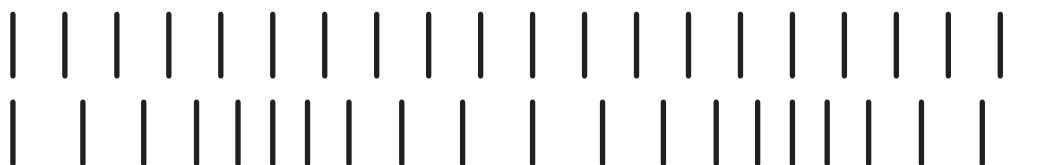
The diagram shows the positions of the molecules of the air at one instant.



Which distance is equal to the wavelength of the wave?

- A PQ B PS C QR D QS
- 23 The top row of bars represents a set of particles inside the Earth and at rest.

The lower row represents the same particles at one instant as a longitudinal wave passes from left to right through the Earth.



What should be measured to determine the amplitude of the oscillations of the particles in the lower row as the wave passes?

- A half the maximum displacement of the particles from their position at rest
 B half the maximum distance apart of the particles
 C the maximum displacement of the particles from their position at rest
 D the maximum distance apart of the particles
- 24 A straight tube is closed at one end and has a loudspeaker positioned at the open end. The frequency of the loudspeaker is initially very low and is increased slowly. A series of loudness maxima are heard. The stationary wave which gives the first maximum has a node at the closed end and an antinode at the open end. The frequency of the loudspeaker is f_1 when the first maximum is heard.

What is the frequency of the loudspeaker when the fourth maximum is heard?

- A $\frac{7f_1}{4}$ B $2f_1$ C $4f_1$ D $7f_1$