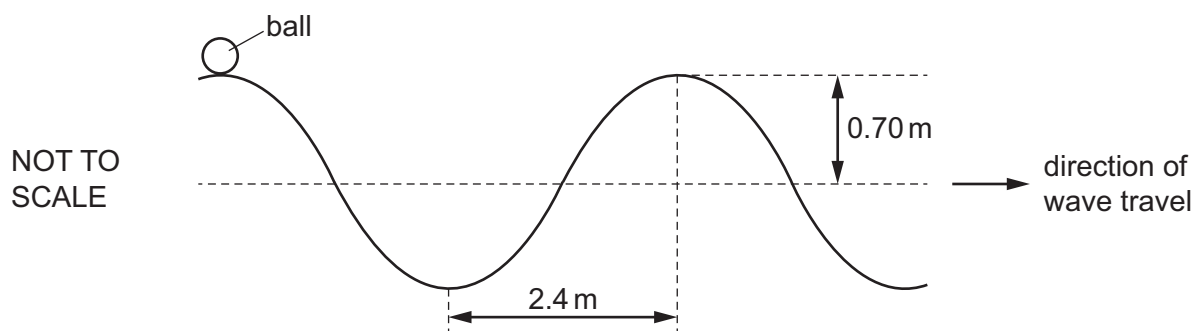


- 22** A transverse water wave is moving along the surface of some water. This causes a ball to move vertically without moving horizontally as it floats upon the surface. At one instant, the ball is at the position shown.

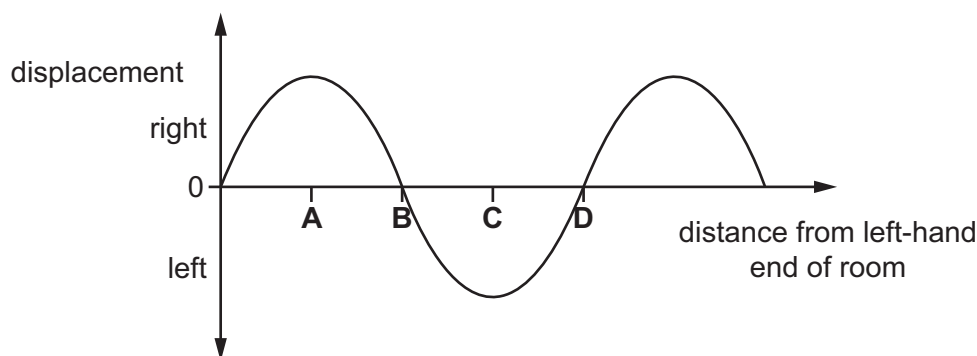


The wave has a frequency of 0.20 Hz and an amplitude of 0.70 m. The distance between a trough and an adjacent peak is 2.4 m.

What is the distance travelled by the ball in a time of 20 s?

- A** 5.6 m      **B** 9.6 m      **C** 11.2 m      **D** 19.2 m
- 23** A sound wave travels from left to right across a room. The variation with distance across the room of the displacement of the air molecules at one instant is shown.

At which distance will the air pressure be lowest?



- 24** A source emits a sound wave of a single frequency. The Doppler effect causes a different frequency of sound to be heard by a stationary observer.

What is a requirement for the Doppler effect to occur?

- A** a source that is moving as it produces the sound wave  
**B** a source that produces a polarised sound wave  
**C** a source that produces a sound wave of changing amplitude  
**D** a source that produces a sound wave of changing frequency