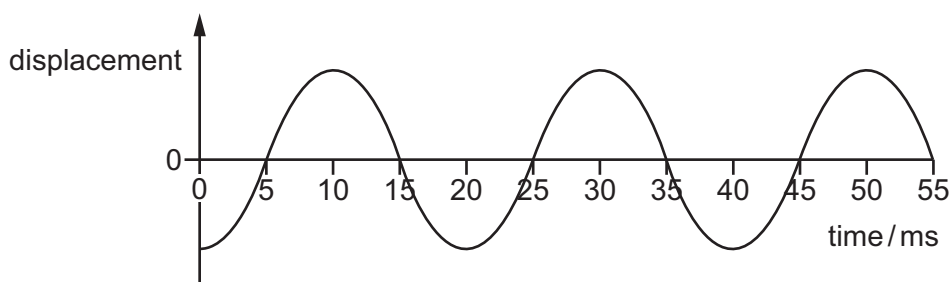
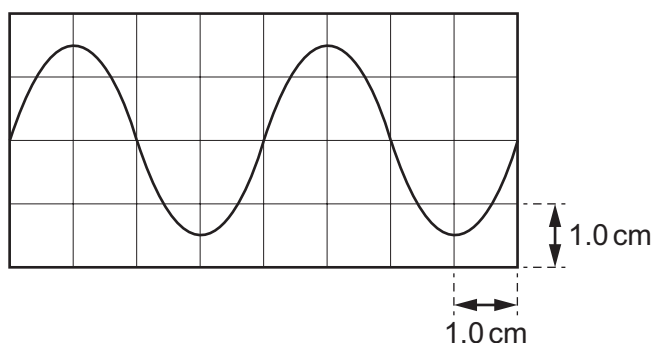


- 23** The graph shows the variation with time of the displacement of an air particle as a progressive sound wave passes through the air. The speed of sound in air is  $330 \text{ m s}^{-1}$ .



What is the wavelength of the wave?

- A** 6.6 m      **B** 8.3 m      **C** 20 m      **D** 25 m
- 24** A microphone is connected to a cathode-ray oscilloscope (CRO). A sound wave of constant frequency is detected by the microphone. The screen of the CRO is shown.



The time-base is set at  $1.0 \text{ ms cm}^{-1}$ .

What is the frequency of the sound wave?

- A** 250 Hz      **B** 500 Hz      **C** 670 Hz      **D** 4000 Hz
- 25** A train's whistle is emitting sound of frequency  $500 \text{ Hz}$  as the train moves with a speed of  $20 \text{ m s}^{-1}$  along a straight track. The train moves directly towards a stationary observer standing next to the track and then passes the observer.

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

What is the difference between the frequencies of the sound heard by the observer before and after the train has passed the observer?

- A** 29 Hz      **B** 32 Hz      **C** 40 Hz      **D** 61 Hz