



2026 Sec 4 Physics Assignment Answers Assignment 12b Sound

Note: Show all formulae & working steps! Express answers to 2 or 3 s.f.

1 C (compression to compression = 1 wavelength)

$$2(a) v = \frac{d}{t} = \frac{300}{0.90} = 330 \text{ m s}^{-1} \text{ (2 s.f.)}$$

(b) The flash travels instantaneously from shooter to him; the time taken for flash to travel from shooter to him is negligible.

Assumptions:

- sound is produced at the same time as the flash seen by the student
- this is not about human reaction time!

3(a) Light from lightning reaches the eye much faster than the sound from the thunder because light travels much faster than sound in air.

$$(b) 340 = \frac{d}{5.0} \rightarrow d = 1700 \text{ m (2 s.f.)}$$

$$(c) d = vt = 340 \times 3.0 = 1020 \text{ m} = 1000 \text{ m (2 s.f.)}$$

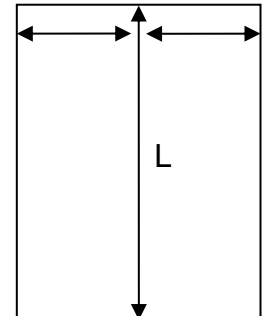
$$(d) v = \frac{(1700 - 1020)}{20 \times 60} = 0.567 \approx 0.57 \text{ m s}^{-1} \quad (2 \text{ s.f.})$$

OR 34 m/min or 2.0 km/h

4

$$(a) v = \frac{2d}{t} = \frac{2 \times (17/2)}{50 \times 10^{-3}} \approx 340 \text{ m s}^{-1}$$

$$(b) v = \frac{2L}{t} \rightarrow 2L = vt \Rightarrow L = \frac{vt}{2} = \frac{340 \times 160 \times 10^{-3}}{2} = 27.2 \approx 27 \text{ m}$$



Note: echo, need to take into account twice the distance travelled to and fro

5

$$(a) v = \frac{2d}{t} \rightarrow d = 1500 \times 0.20 / 2 = 150 \text{ m}$$

$$(b) v = f\lambda \rightarrow \lambda = \frac{v}{f} = \frac{1500}{15 \times 10^3} = 0.10 \text{ m}$$

6	Diagram	Reason
(a) sound of lower pitch	Fig. 6.1	It has a lower frequency
(b) louder sound	Fig. 6.1	It has a larger amplitude

Note: on oscilloscope display, horizontal time axis: longer period T means lower frequency f