Solutions

Each answer shows the steps, then the **result**.

2.1

- **transverse**: particles vibrate **perpendicular** to the energy-travel direction
- **longitudinal**: particles vibrate **parallel** to it

2.2

- transverse — any one: light / EM wave, wave on a rope, water ripple
- longitudinal — sound, slinky compression wave

2.3

- **compressions** and **rarefactions**

2.4

- displacement–time graph → the **period** T (and so frequency)
- displacement–distance graph → the **wavelength** λ

3.1 C

- sound is **longitudinal**: oscillation is **along** the direction of travel
- **A**, **B**, **D** are transverse (they can be polarised; sound cannot)

3.2

- air particles vibrate **back and forth parallel** to the wave's direction
- forming high-pressure **compressions** and low-pressure **rarefactions**

3.3

- **transverse**

3.4

- $f = 1/T$

$$f = \frac{1}{0.020\ \text{s}} = \mathbf{50}\ \text{Hz}$$

3.5

- it can be **polarised** (restricted to one plane of vibration) — a longitudinal wave cannot