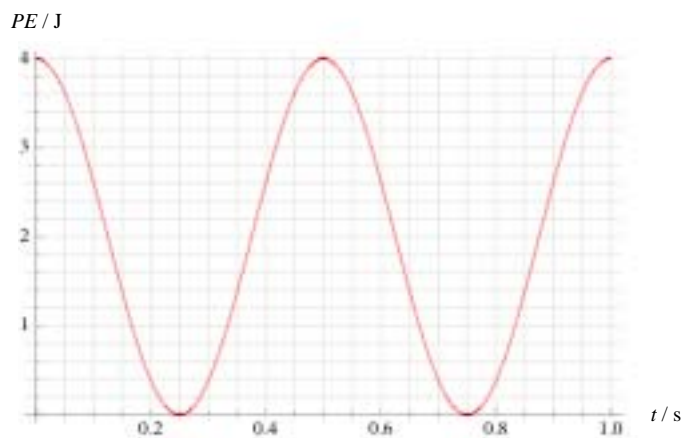
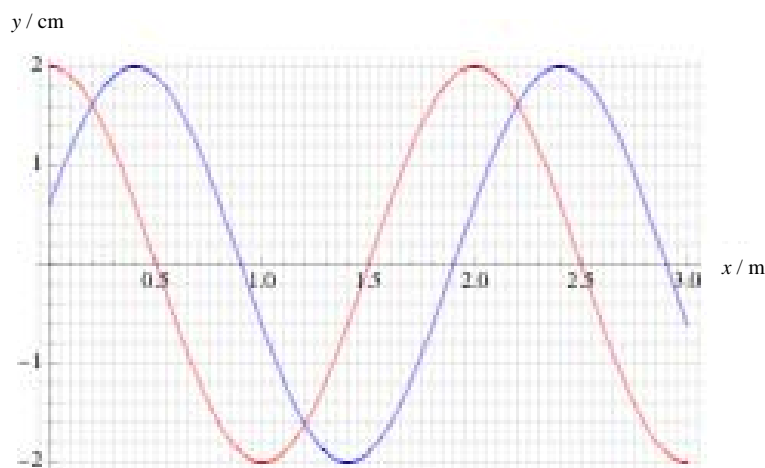


Support Worksheet – Topic 4, Worksheet 2

- 1** The graph shows the variation with time of the potential energy of a body executing simple harmonic motion.



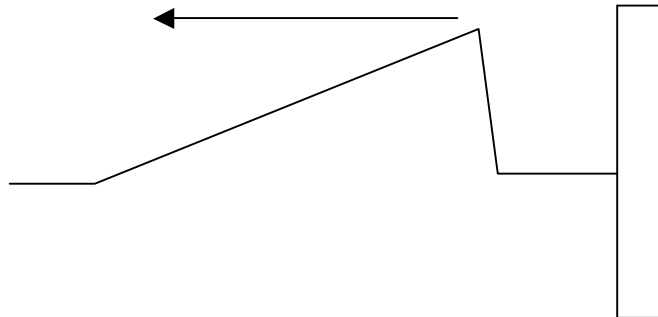
- a** On the same axes draw a sketch graph to show the variation with time of the kinetic energy of the body. [2]
- b** State the period of oscillations. [1]
- 2** The mass of the body of question **1** is 0.50 kg. Determine the amplitude of oscillations. [2]
- 3** State the difference between a longitudinal and a transverse wave. [1]
- 4** The graph shows the variation with distance of the displacement of a wave at two different times. The curve in red is at $t = 0$ s and the one in blue at $t = 16$ ms.



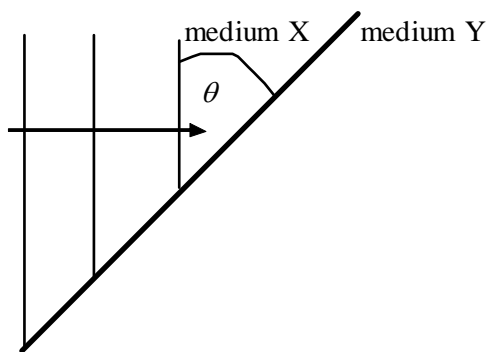
Use the graph to determine, for this wave:

- a** the amplitude. [1]
- b** the wavelength. [1]

- c the speed. [2]
- d the frequency. [1]
- 5 State the relation between a ray and a wavefront. [1]
- 6 The diagram shows an idealised pulse on a string approaching a fixed end.



- Draw the reflected pulse. [2]
- 7 The diagram shows wavefronts of a wave as they approach a boundary to a new medium and $\theta = 45^\circ$. The speed of the waves in medium X is v and in medium Y it is $\frac{v}{2}$.



- a Calculate the angle between the wavefronts in medium Y and the boundary. [2]
- b Draw lines to extend the first two wavefronts into medium Y. [2]
- 8 Plane wavefronts of a wave of wavelength λ are approaching a rectangular opening of size b . State the relation between λ and b such that there is appreciable diffraction of the wave at the opening. [1]