4 The centre of the cone of a loudspeaker is oscillating with simple harmonic motion of frequency 1400 Hz and amplitude 0.080 mm.

(a) Calculate, to two significant figures,

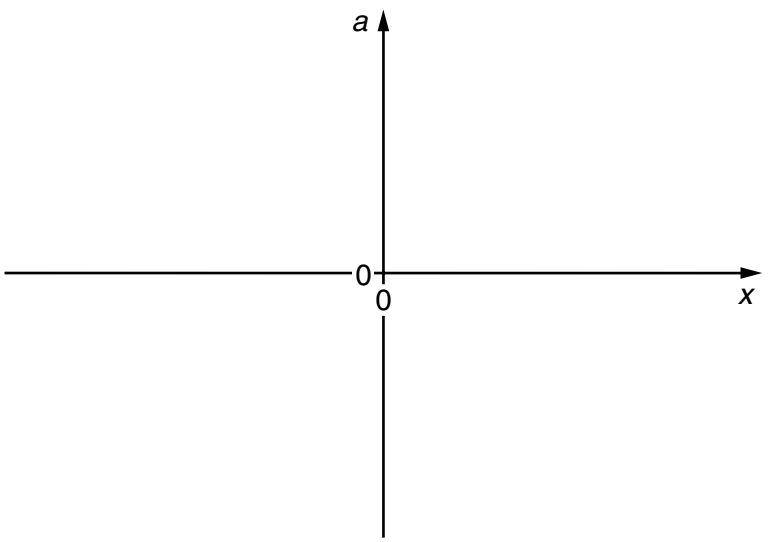
(i) the angular frequency ω of the oscillations,

ω = ... rad s^{-1} [2]

(ii) the maximum acceleration, in m s^{-2}, of the centre of the cone.

acceleration = ... m s^{-2} [2]

(b) On the axes of Fig. 4.1, sketch a graph to show the variation with displacement *x* of the acceleration *a* of the centre of the cone.



[2]

Fig. 4.1

(c) **(i)** State the value of the displacement x at which the speed of the centre of the cone is a maximum.

x = ... mm [1]

(ii) Calculate, in m s^{-1}, this maximum speed.

speed = ... m s^{-1} [2]