17 Simple harmonic motion – Part 1 — Answers

Answers

Work through these after trying the questions yourself.

17.1 The displacement from equilibrium.

17.2 Back towards the equilibrium point.

17.3 $a = -\omega^2 x$.

17.4 The acceleration is directed back towards equilibrium (opposite to the displacement).

17.5 $a = -\omega^2 x = -(4.0)^2(0.050) = -0.80$ m s^{-2} (towards equilibrium).

17.6 Greatest at the ends, where x is largest; zero at the centre, where $x = 0$. This follows from $a = -\omega^2 x$.

17.7 The acceleration always points to the centre. Moving towards the centre, the acceleration is in the same direction as the motion, so it speeds up; moving towards the ends, the acceleration opposes the motion, so it slows down.