

Definitions and Concepts for AQA Physics A-level

Topic 6.1: Further Mechanics

Angular Speed: A measure of the speed of an object's angular rotation. It is equal to the frequency of rotation multiplied by 2π .

Centripetal Acceleration: The acceleration of an object moving in circular motion. Any object in circular motion must have an acceleration since the direction of the object, and therefore the velocity of the object, is constantly changing.

Centripetal Force: The resultant force responsible for an object moving in circular motion. Centripetal forces always act towards the centre of the object's rotation.

Critical Damping: The form of damping that reduces the displacement of an oscillating object to its equilibrium position in the quickest time possible and without further oscillation.

Damping: The dissipation of energy from an oscillating system. The consequence is that the amplitude of oscillation will decrease. Damping occurs when a force opposes the system's motion.

Forced Vibrations: Repeated up and down oscillations, at the frequency of a driver. The amplitude of oscillation is small at high frequencies and large at low frequencies.

Free Vibrations: Oscillations that are not caused by a driver. An object will naturally oscillate at its natural frequency.

Overdamping: A type of damping where the system is damped more than required to stop the oscillations. It takes longer for the system to return to equilibrium than for critical damping.

Radian: A unit of angle.

Resonance: Resonance occurs when the frequency of oscillations is equal to the natural frequency of the oscillating system. The rate of energy transfer is at a maximum during resonance.

Simple Harmonic Motion: Motion where the acceleration of an object is directly proportional, and in the opposite direction, to its displacement.

Underdamping: A type of damping where energy is gradually removed from the system and the amplitude of oscillations slowly decreases.

