

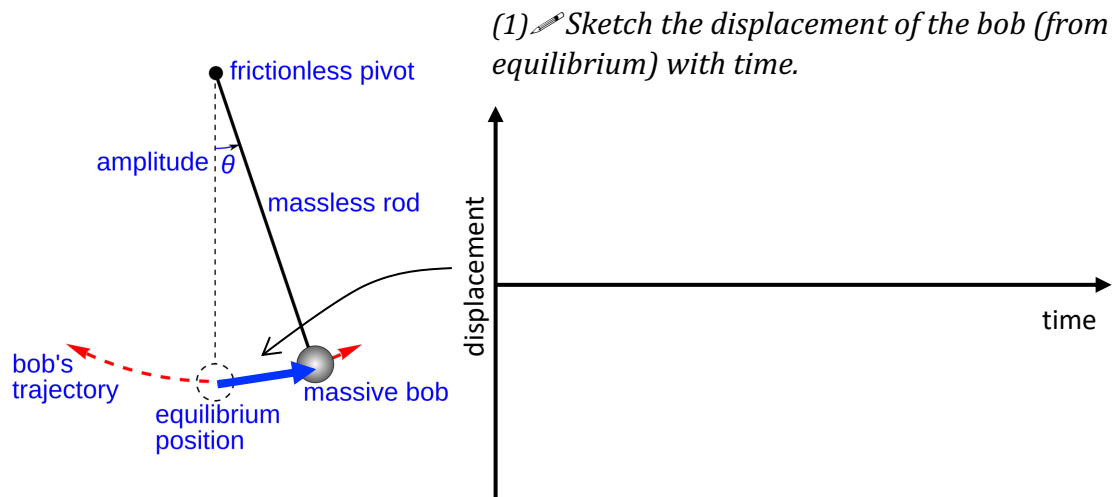
6.2.1 Oscillations

Oscillations are movements back and forth in a repeating pattern. Two examples are the simple pendulum and the mass on a spring (spring pendulum).



videos

Pendulum

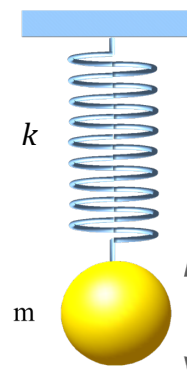
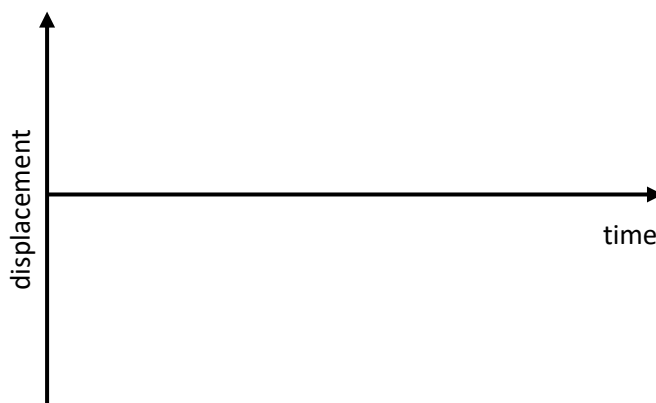


(2) ✍ What mathematical function could be used to describe this graph?

Mass on a spring

The mass oscillates up and down in a repeating pattern.

(3) ✍ Sketch a graph of the displacement of the mass from the equilibrium position against time.



(4) ✍ Mark on your graph the **period** of the oscillation. Label it T .

(5) ✍ At what points would the mass be moving fastest? Mark on the graph where this would occur. Label it v_{max} .

(6) ✍ On the graph, above, mark on the **amplitude** of the oscillation (label it A), and describe what amplitude is.

Angular frequency

Angular frequency is defined as:

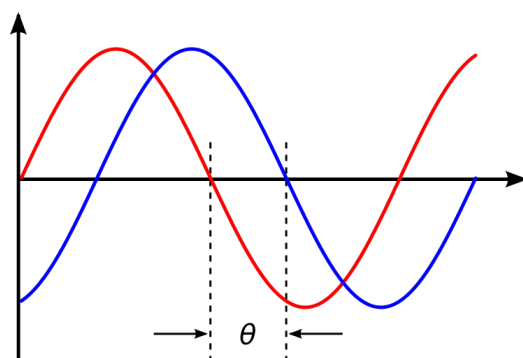
$$\omega = \frac{2\pi}{T} = 2\pi f$$

The units are radians per second (rads^{-1}).

(7) ✍ If a particular oscillator oscillates with a period of 0.125s, what is the angular frequency?

(8) ✍ Describe what you think angular frequency represents.

Phase Difference



You have come across phase difference before in the topic of wave interference. Phase difference is an angle, and represents the angular difference between two oscillations with the same frequency.

Phase difference can be expressed as an angle in degrees or in radians.

(9) ✍ Sketch waves which have a phase difference of i) 90° , ii) $\pi/8$ rad