

SHM questions SL

1. A 396 g mass vibrates according to the equation $x = 0.38 \sin(5.56t)$ where x is in meters and t is in seconds.

(a) State the amplitude.

Answer =

Unit =

(b) Determine the frequency.

Answer =

Unit =

(c) Determine the period.

Answer =

Unit =

2. The position in cm of a mass in simple harmonic motion is given by $x = 4\cos(3t)$ where t is the time after the start of the oscillation in seconds. Find;

(a) The amplitude of the motion

Answer =

Unit =

(b) The period

Answer =

Unit =

(c) The frequency of the oscillation

Answer =

Unit =

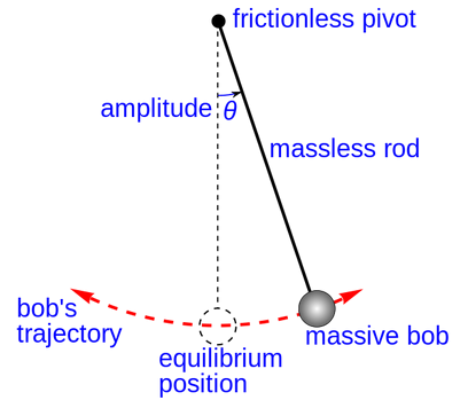
SHM pendulum questions

1. A large pendulum of mass 2.6 kg has a length of 4.63 m.
(a) Determine its period, T .

Answer =

Unit =

- (b) Explain why a pendulum of twice the mass has the same period (assuming it has the same length)



- (c) Determine the angular velocity

Answer =

Unit =

- (d) Determine the oscillators total energy if it has an amplitude 1.2 m.

Answer =

Unit =

2. A 435 g mass is oscillating horizontally between two springs with a frequency of 0.849 Hz. If its total energy is 4.28 J, determine:
(a) The amplitude of the motion

Answer =

Unit =

3. An oscillator of mass 786 g has a total energy of 2.4 J.
(a) Calculate its period if it has an amplitude of 23 cm.

Answer =

Unit =

SHM spring questions

1. A mass of 500 g is set to oscillate on a spring of spring constant 82 N m^{-1} . The distance between the highest and lowest position of the spring is 24cm.
- a. What would be the period of one oscillation?

Answer =

Unit =

- b. What would the maximum acceleration of the mass be?

Answer =

Unit =

- c. When would this maximum acceleration be?

- d. When is the acceleration of the spring 0?

- e. What is the total energy of the system?

Answer =

Unit =

- f. The mass is increased to 1 kg, what would the new period be?

Answer =

Unit =

- g. The student returns to using the 500 g mass, but places two springs in parallel. Calculate the period of oscillation now?

Answer =

Unit =