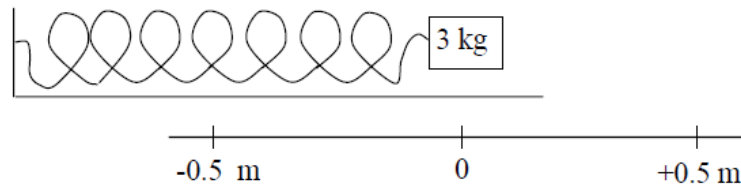


## 2021 Worksheet 10

### Year 13 Physics

Write the answers in your Exercise Book.

1. A small mass vibrating with SHM has a velocity of 2 m/s as it passes through its equilibrium position– the midpoint of the motion.
  - (a) What is the velocity of the mass at its maximum displacement? **(1 mark)**
  - (b) If the amplitude of the vibration is 10 cm, what is the period? **(1 mark)**
  
2. A 3 kg mass is oscillating at the end of a spring.



Given

- spring constant:  $k = 300 \text{ N/m}$ .
- amplitude:  $A = 0.5 \text{ m}$ .

calculate the

- (a) angular frequency:
  - (b) **maximum** velocity of the mass. **(1 mark)**
  - (b) **maximum** acceleration of the mass **(1 mark)**
  - (c) **total** energy of the system. **(1 mark)**
  - (d) **potential energy** at the point where the mass is moving at 2 m/s **(2 marks)**
  - (e) **speed** of the mass 0.25 m from the equilibrium position. **(2 marks)**
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2. A diffraction grating having 5 000 lines per centimetre was used to find the wavelength of a monochromatic light source. The second order maximum for a certain yellow light was formed at an angle of  $30^\circ$  from the central maximum.  
  
Find the wavelength of the light source. **(2 marks)**