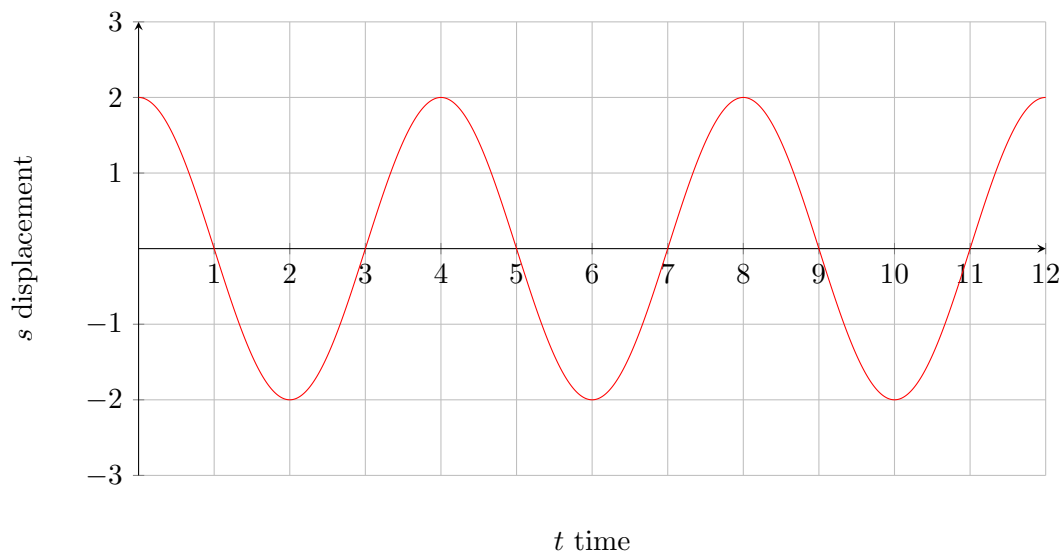


1 Simmple Harmonic Motion:

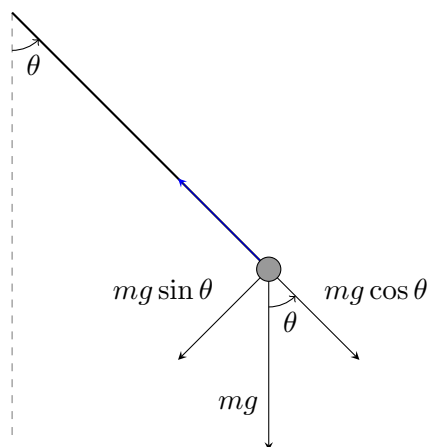
1.1 Definition:

The type of oscillatory motion in which the acceleration of the oscillating body is proportional to the body's displacement from the equilibrium position and always acts towards the equilibrium position.

1.2 Graph:



1.3 Diagram:



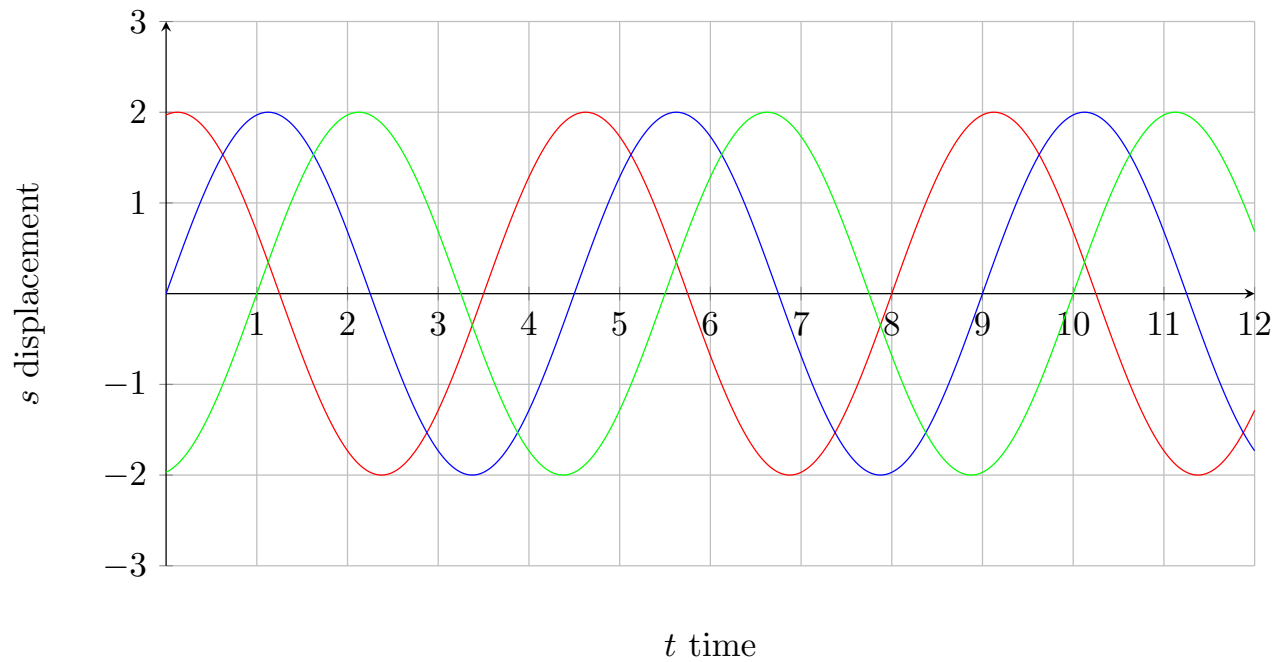
1.4 Equation:

$$a = -\frac{4\pi^2}{T^2} \times x \quad (\text{m s}^{-2})$$

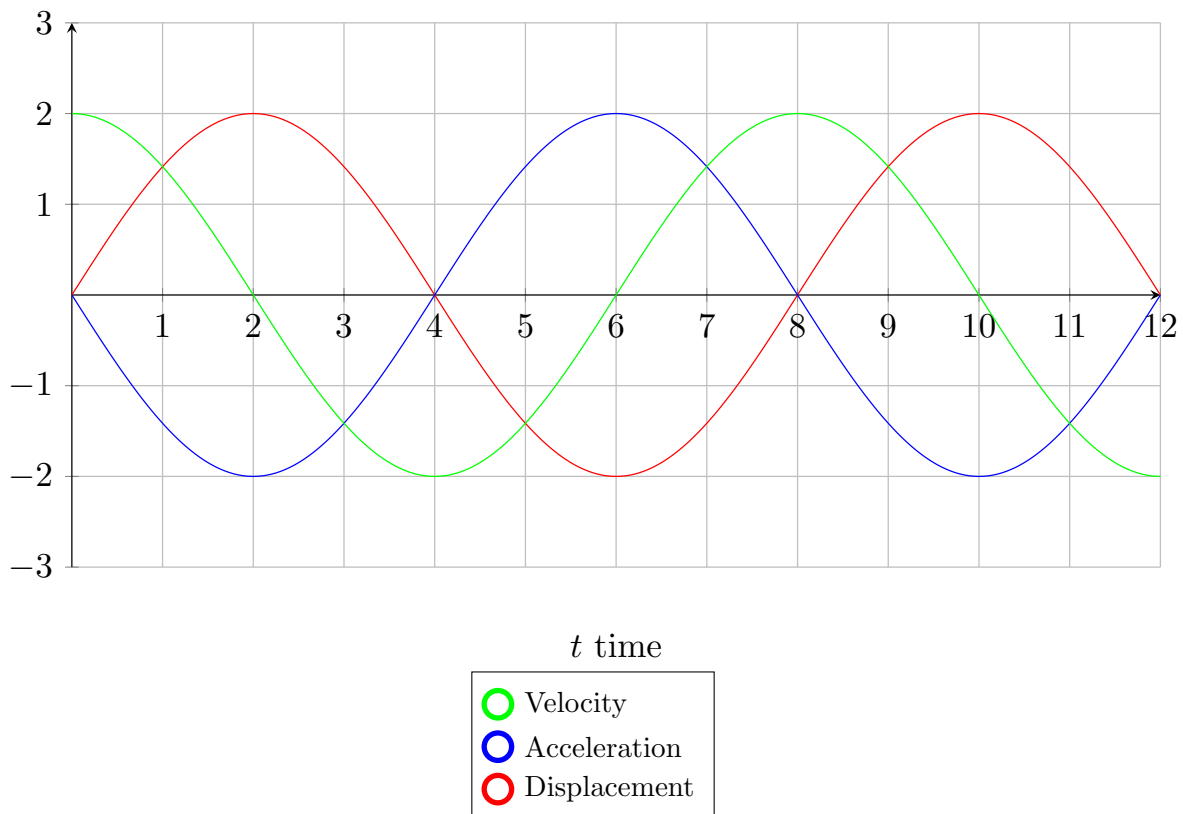
Where T is the **periodic time** (s).

2 Phase difference:

2.1 $\frac{T}{4}$, $\frac{T}{2}$ phase difference:



2.2 Full representation of SHM:

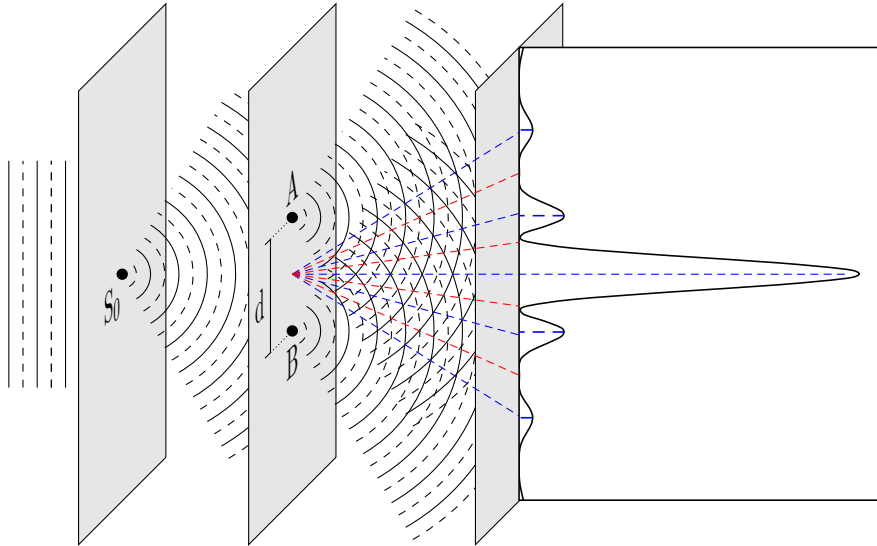


3 n^{th} harmonic

$$f_n = \frac{n}{2l} \sqrt{\frac{T}{\mu}} \quad (1)$$

Where l is the **length** (m) of the given string, T the **tension** (N) present through it and μ its **linear mass density** (kg m^{-1}).

4 Young's Double Slit Experiment



The observable pattern achieved in this experiment can be seen above. It consists of alternate dark and bright bands. The central band, the one equidistant from both slits is always bright ($AO - BO = 0\lambda$)

destructive interference \Rightarrow dark

constructive interference \Rightarrow bright

4.1 Path difference

Bright band

$$n\lambda, n \in \mathbb{N}$$

Dark band

$$n\frac{1}{2}\lambda, n \in \mathbb{N}$$

4.2 Bright slit interval distance:

$$y = \frac{D\lambda}{d} \quad (\text{m})$$

Where D is the **distance** (m) between the slits and the screen, d is the **separation** (m) between the two slits and λ the **wavelength** (m) of the wave at the source.