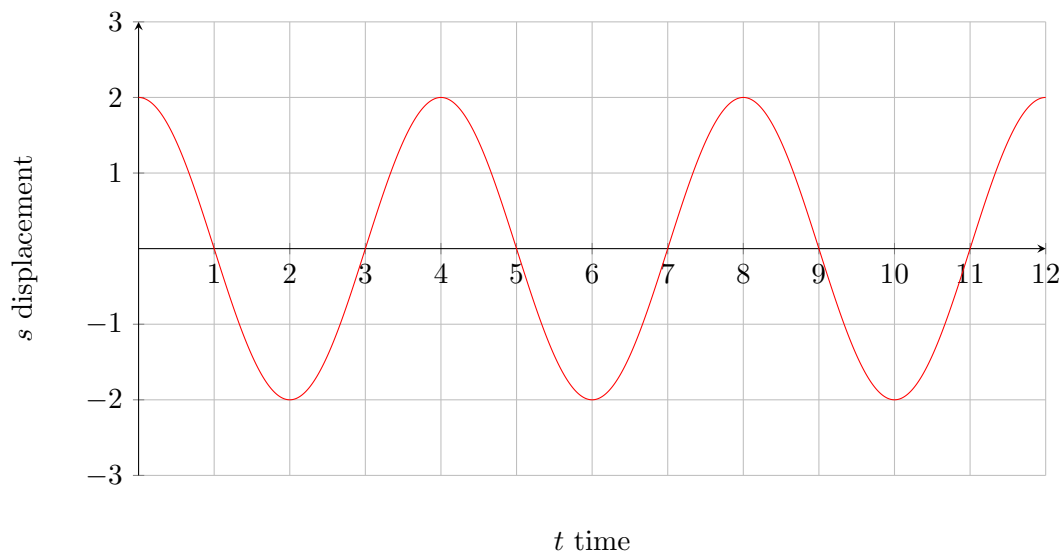


# 1 Simple Harmonic Motion:

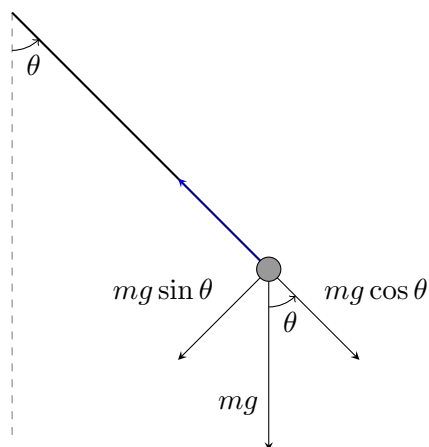
## 1.1 Definition:

*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:

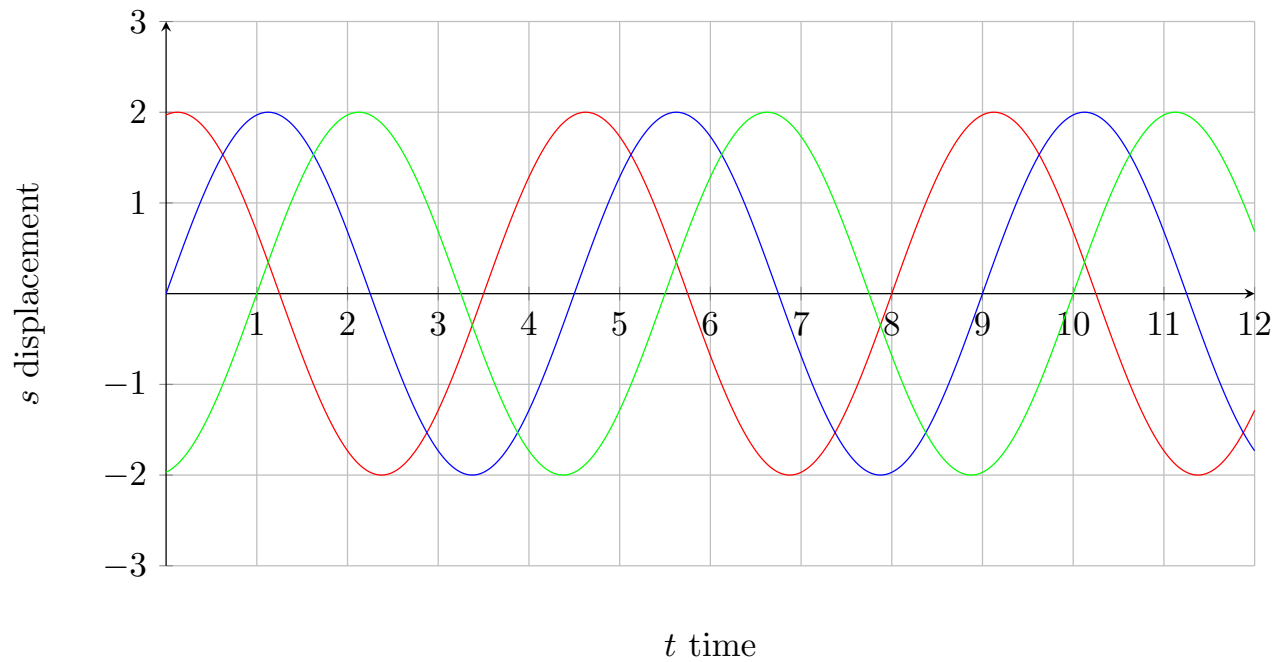


## 1.4 Equation:

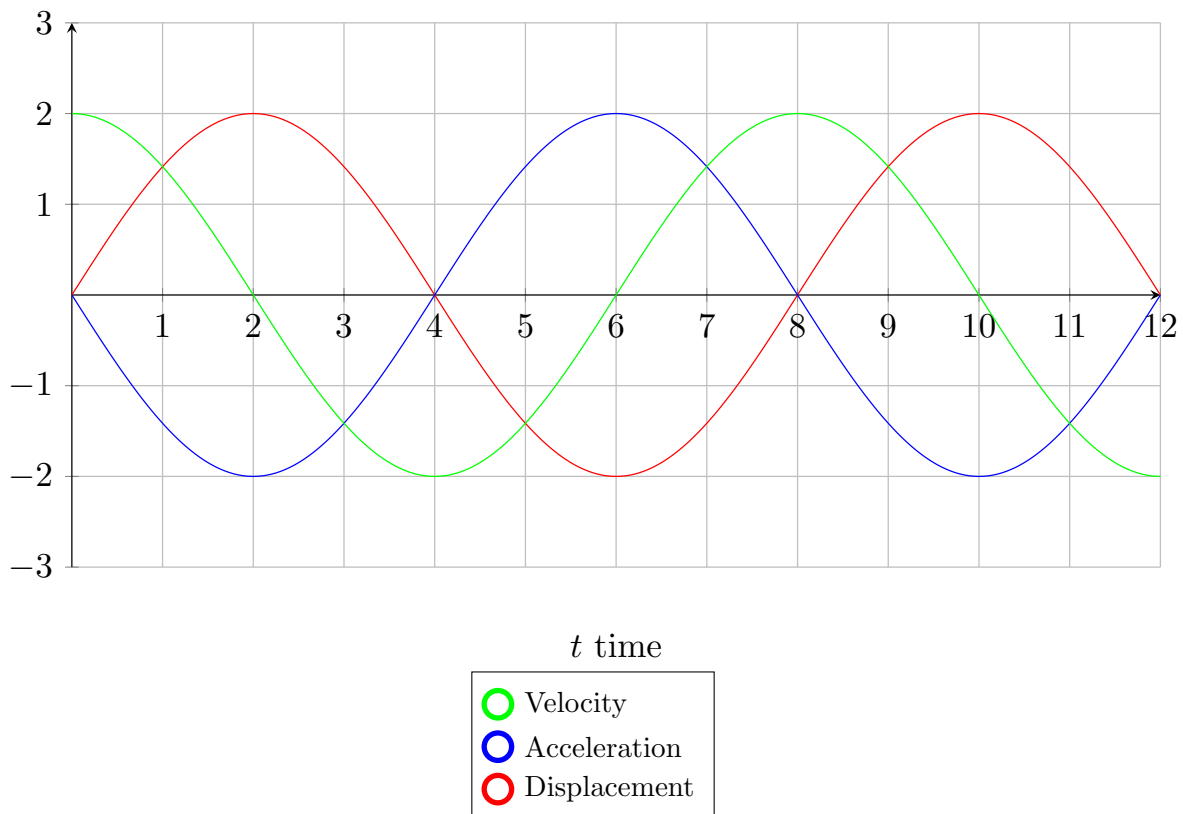
$$a = -\frac{4\pi^2}{T^2} \times x \quad (\text{m s}^{-2})$$

## 2 Phase difference:

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



### 2.2 Full representation of SHM:

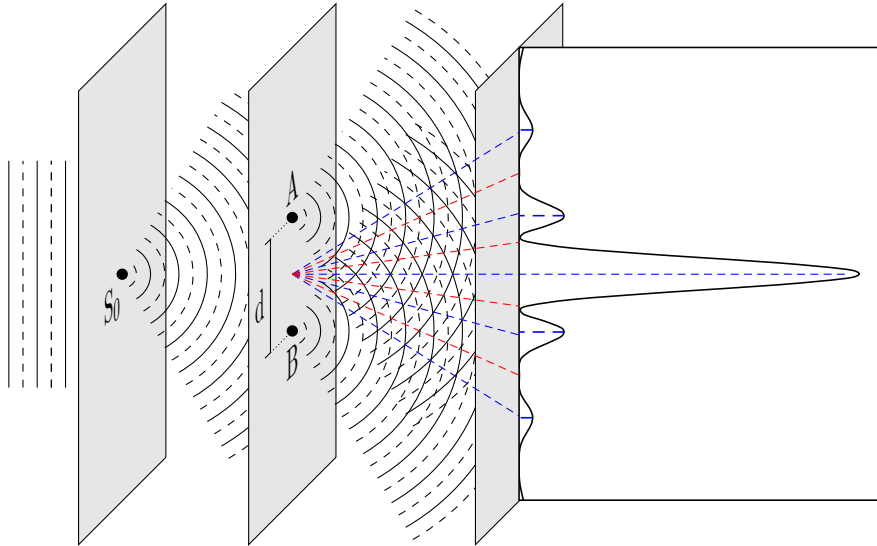


### 3 $n^{\text{th}}$ harmonic

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

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

### 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  $\implies$  dark

constructive interference  $\implies$  bright

#### 4.1 Bright slit interval distance:

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

Where  $D$  is the distance between the slits and the screen,  $d$  is the separation between the two slits and  $\lambda$  the wavelength of the wave at the source.