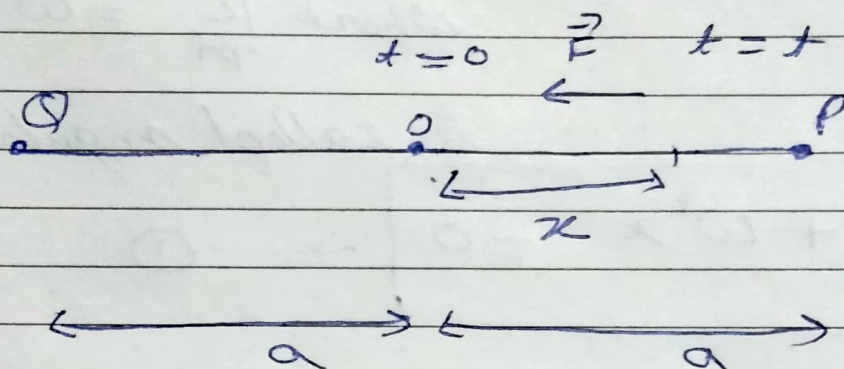


# IDEA OF S.H.M

S.H.M is a type of periodic motion where the restoring force on the moving object is directly proportional to the displacement of object from its mean position



$$F \propto -x$$

$$F = -kx$$

where  $k =$  force constant

## Differential equation of S.H.M

As  $F = -kx$

$$mA = -kx$$

From Newton's second law of motion

$$F = mA$$

| JUNE |    |    |    |    |    |    | 2012 |
|------|----|----|----|----|----|----|------|
| M    | T  | W  | T  | F  | S  | S  |      |
|      |    |    |    | 1  | 2  | 3  |      |
| 4    | 5  | 6  | 7  | 8  | 9  | 10 |      |
| 11   | 12 | 13 | 14 | 15 | 16 | 17 |      |
| 18   | 19 | 20 | 21 | 22 | 23 | 24 |      |
| 25   | 26 | 27 | 28 | 29 | 30 |    |      |

| JULY |    |    |    |    |    |   | 2012 |
|------|----|----|----|----|----|---|------|
| M    | T  | W  | T  | F  | S  | S |      |
| 30   | 31 |    |    |    |    |   |      |
| 2    | 3  | 4  | 5  | 6  | 7  |   |      |
| 9    | 10 | 11 | 12 | 13 | 14 |   |      |
| 16   | 17 | 18 | 19 | 20 | 21 |   |      |
| 23   | 24 | 25 | 26 | 27 | 28 |   |      |

$$m \frac{d^2 x}{dt^2} = -kx$$

$$\frac{d^2 x}{dt^2} = -\frac{k}{m} x$$

$$\frac{d^2 x}{dt^2} + \frac{k}{m} x = 0$$

where  $\frac{k}{m} = \omega^2 \Rightarrow \omega = \sqrt{\frac{k}{m}}$

is called angular velocity

$$\boxed{\frac{d^2 x}{dt^2} + \omega^2 x = 0} \quad \text{--- (1)}$$

the above eq<sup>n</sup> represents differential eq<sup>n</sup>  
S.H.M