

CHAPTER 10: Springs

Force applied to stretch or compress an spring : $F = kx$

Restoring force exerted by a spring : $F = -kx$

Harmonic Motion :

$$f = \frac{1}{T} = \frac{\omega}{2\pi} \quad (\omega \text{ in rad / s})$$

$$\omega = \sqrt{\frac{k}{m}}$$

$$x = A \cos(\omega t) \quad ; \quad x_{MAX} = A$$

$$v = -A\omega \sin(\omega t) \quad ; \quad v_{MAX} = A\omega$$

$$a = -A\omega^2 \cos(\omega t) \quad ; \quad a_{MAX} = A\omega^2$$

Elastic Potential Energy : $PE_{elas} = \frac{1}{2}kx^2$

Simple pendulum :

$$\omega = 2\pi f = \sqrt{\frac{g}{L}}$$