

Answer on Question #59258-Physics-Mechanics-Relativity

In an experiment to determine the period of oscillation of a loaded spiral spring, the equation of a simple harmonic oscillator $a = -\left(\frac{k}{m}\right)x$, where the symbols have their usual meaning, was used. Write down the equation for the angular frequency ω in terms of k and m , the effective mass of the system

Answer

$$a = \ddot{x} = -\left(\frac{k}{m}\right)x \rightarrow \ddot{x} + \left(\frac{k}{m}\right)x = 0$$

The equation of a simple harmonic oscillator is

$$\ddot{x} + \omega^2 x = 0$$

Thus, the equation for the angular frequency ω in terms of k and m is

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