

Answer on Question #51013-Physics-Other

Which of the following is the correct unit of k in the equation of a damped harmonic oscillator given as

$$-bv - kx = ma,$$

where b is the damping factor and all the symbols have their usual meaning?

Answer

The unit of kx is the same as unit of ma

$$[kx] = [ma].$$

The unit of k is

$$[k] = \left[\frac{ma}{x} \right] = \frac{kg \cdot \frac{m}{s^2}}{m} = \frac{kg}{s^2}.$$

Answer: $kg \cdot s^{-2}$.

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