

Answer on Question #64552, Physics / Other

A 4.00 kg mass is attached to a horizontal spring with a k value of 12.5 N/m. The spring is displaced 0.750 m from its equilibrium position. Calculate the acceleration of the mass.

Solution:

The angular frequency ω is given by

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

The acceleration of a mass is given by

$$a = -\omega_0^2 x = -\frac{k}{m} x$$

Substituting,

$$a = -\frac{12.5 \text{ N/m}}{4.00 \text{ kg}} \times 0.750 \text{ m} = -2.34 \text{ m/s}^2$$

Answer: -2.34 m/s^2