**Answer on Question #50089 – Physics - Mechanics | Kinematics | Dynamics**

Vibrations
A horizontal frictionless mass-spring system is set to oscillate at 10 Hz. If the spring constant is 450 N/m, what is the mass of the object?

**Solution:**
$f = 10\ Hz - frequency;$
$k = 450\dfrac{N}{m} - spring\ constant;$
$m - mass\ of\ the\ object;$

Formula for the frequency for the mass-spring system:

$$f = \frac{1}{T} = \frac{1}{2\pi\sqrt{\frac{m}{k}}}$$

$$2\pi f\sqrt{\frac{m}{k}} = 1$$

$$4\pi^2 f^2 m = k$$

$$m = \frac{k}{4\pi^2 f^2} = \frac{450\frac{N}{m}}{4 \cdot 3.14 \cdot (10\ Hz)^2} = 0.36\ kg$$

**Answer:** mass of the object is equal to $0.36\ kg$.