34kg object is attached to a spring with a spring constant 165N/m so that the object is allowed to move on a horizontal frictionless surface. The object is released from rest when the spring is compressed 0.13m.
Find the force on the object in N.
What is the acceleration at this instant? (m/s^2)

Solution:

Let:

$m = 34\ kg$

$k = 165\ {}^{N}/_{m}$

$x = 0.13m$

$F - ?$

$a - ?$

According to Newton's second law: $\mathrm{a} = \frac{\mathrm{F}}{\mathrm{m}}$

According to Hooke's law: $\mathrm{F} = \mathrm{kx}$

$$\boldsymbol{F = 165 * 0.13 = 21.45\ N}$$

$$\boldsymbol{a = \frac{21.45}{34} = 0.63\ \ {}^{m}/_{S^2}}$$