Pre-lab 3

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1. A force of 5 N to is required to compress an industrial spring by 0.0001 meters, how much force is required to compress this spring by 0.0003 meters?

Ans:

Here, given, $F_1 = 5\,N$, $x_1 = 0.0001\,m$

we know, spring constant, $k = -\frac{F_1}{x_1}$

$\Rightarrow k = -\frac{5\,N}{0.0001\,m}$

$\therefore k = -50000\,Nm^{-1}$

Now, Here, $F_2 = ?$, $x_2 = 0.0003\,m$

So, $F_2 = -kx_2$

$= -(-50000\,Nm^{-1}) \times (0.0003\,m)$

$= 15\,N$

(Ans: 15 N)

2. You have a certain set-up of a vertical spring, and when hung freely the equilibrium position reading is 30cm on earth. If you take the same set-up on the moon surface, would the equilibrium position be more than, less than or equal to 30cm? Explain.

Ans: According to this question, we have certain set-up of a vertical spring, and when hung freely the equilibrium position reading is 30 cm on earth. Now if we take the same set-up on the moon surface, the equilibrium position would be less than to 30cm. Because of gravity. The moon's surface gravity is about 1/6 th as compare to the earth. So, the equilibrium position would be less than to 30cm on moon.