**Answer on Question #90400, Physics / Mechanics | Relativity**

1. A spiral extends by 5 cm, under a load of 6 N. When the load is replaced by steel block, the new extension is 7 cm. Calculate the weight of the steel block.

**Solution:**

If the spring extends by an amount $x$ due to the applied force $F$ then
$$F = kx\ldots\ldots\ldots (1)$$
where k is the spring constant.



The spring extends by $x_1 = 5\ cm$ due to the application of $F_1 = 6\ N$ force.

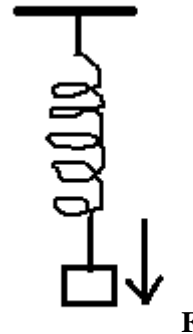Let $F_2$ newton force is required to extends the spring by $x_2 = 7\ cm$ when the steel block is placed.

Then from equation (1)

$$\frac{F_2}{F_1} = \frac{x_2}{x_1}$$

$$F_2 = F_1 \frac{x_2}{x_1}$$

$$F_2 = 6 \times \frac{7}{5}\ N$$

$$\boxed{F_2 = 8.4\ N}$$

Therefore, the weight of the steel block is 8.4 N.