Trabalho das forças Externas:

$$\sum F_i \, v_i = 6 \times_G + 35 \times_B =$$

$$\sum F_i v_i = 6 \cdot \left(\frac{5}{8} \, x\right) + 35 \cdot \left(\frac{3}{4}\right) x$$

$$\sum F_i v_i = \frac{15}{4} x + \frac{105}{4} x = \frac{120}{4} x$$

$$\sum F_i v_i = 30 \, x \cdot Kg$$

Energia total do sistema é:
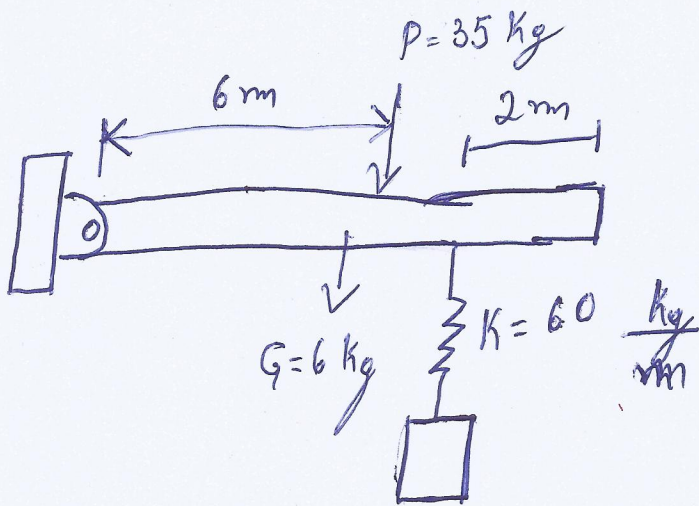
$$\pi = \sum \Lambda - \sum F_i v_i$$

$$\pi = 30 \, x^2 - 30 x$$

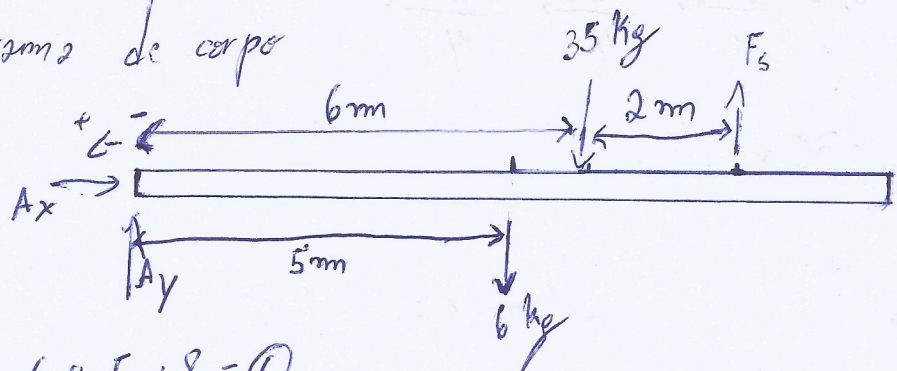$$\frac{\partial \pi}{\partial x} = \frac{\partial}{\partial \rho} \left(30 x^2 - 30 x\right) = 0$$

$$60 x - 30 =$$
$$\therefore x = \frac{1}{2} \text{ metro}$$

$P = 35\,Kg$

$6\,m$ $2\,m$

$G = 6\,Kg$ $K = 60\,\dfrac{Kg}{m}$

Ache a deflexão da mola

Usando estática e diagrama de corpo livre

$35\,Kg$ F_s

$6\,m$ $2\,m$

A_x

A_y $5\,m$ $6\,Kg$

$+) \sum M_A = 0$
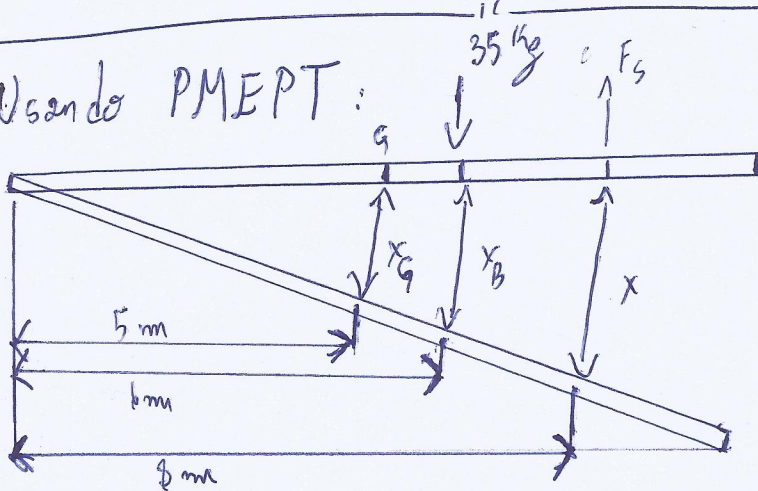
$\sum M_A = (-6)\cdot 5 - 35 \cdot 6 + F_s \cdot 8 = 0$

$-30 - 210 + 8F_s = 0$

$F_s = 30\,Kg$

$F_s = kx \Rightarrow x = \dfrac{F_s}{k} = \dfrac{30}{60} = \dfrac{1}{2}\,m$

Usando PMEPT:

$35\,Kg$ F_s

G

x_G x_B x

$5\,m$

$6\,m$

$8\,m$

$\Lambda = \dfrac{1}{2}kx^2 = \dfrac{1}{2}\,60\,x^2$

$\Lambda = 30x^2$

Por semelhança de triângulos temos:

$\dfrac{x}{8} \times \dfrac{x_G}{5} \qquad \dfrac{x}{8} \times \dfrac{x_B}{6}$

$x_G = \dfrac{5}{8}x \qquad x_B = \dfrac{3}{4}x$