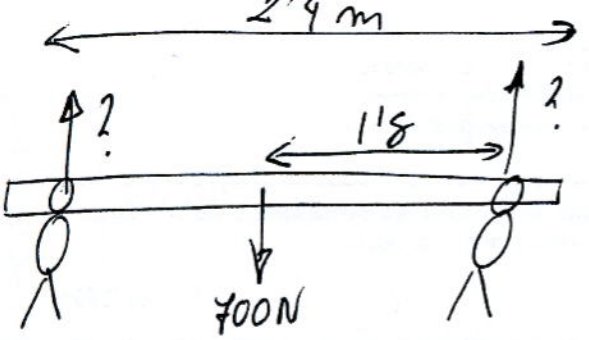
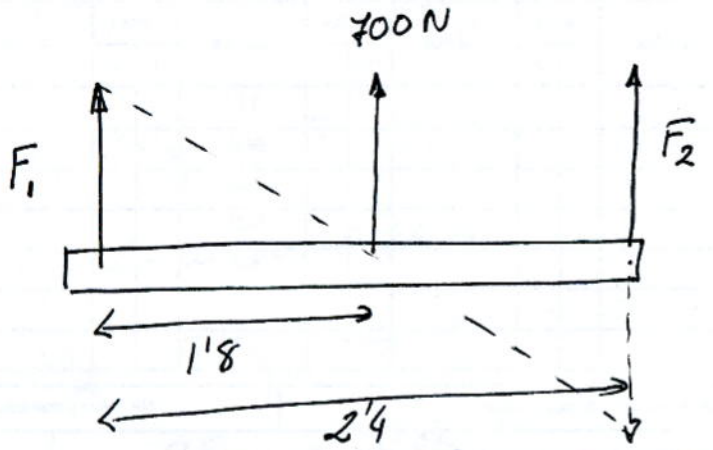
③





$F_1 \cdot d_1 = F_2 \cdot d_2$

$F_1 + F_2 = 700\ N$

$d_1 = 1'8$

$d_2 = 2'4 - 1'8 = \underline{0'6\ N}$

$$\begin{cases} F_1 \cdot 1'8 = F_2 \cdot 0'6 \\ F_1 + F_2 = 700 \end{cases} \quad \begin{cases} F_1 = 700 - F_2 \\ (700 - F_2) \cdot 1'8 = F_2 \cdot 0'6 \\ 1260 - 1'8\,F_2 = F_2 \cdot 0'6 \end{cases}$$

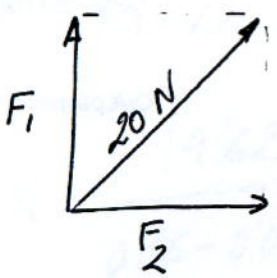
$$1260 = F_2 \cdot 0'6 + F_2 \cdot 1'8$$

$$1260 = 2'4 \cdot F_2 \longrightarrow F_2 = \frac{1260}{2'4} = 525\ N$$

$$F_1 = 700 - 525 = \underline{175\ N}$$

④

$F_1 = F_2$

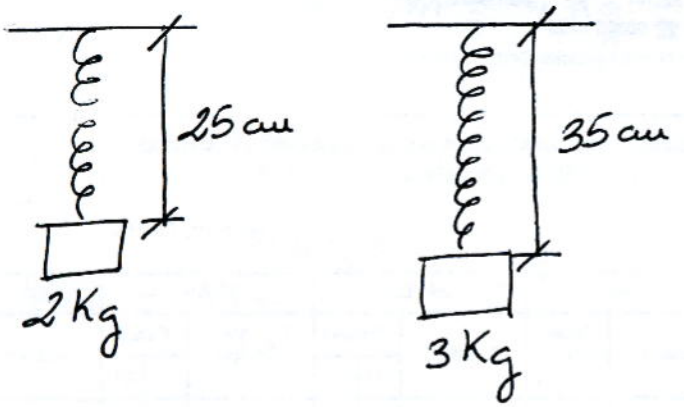


$h^2 = c^2 + c^2$

$$F_R = \sqrt{F_1^2 + F_2^2} = \sqrt{2F_1^2} = 20\ N$$

$$F_1 = \sqrt{\frac{20^2}{2}} = \underline{14'14\ N} = F_2$$

5)



$F = K(L - L_0)$

ley de Hooke

① $\begin{cases} m_1 = 2\,Kg \rightarrow F_1 = 2 \cdot 9'81 = 19'62\,N \\ L_1 = 25\,cm = 0'25\,m \end{cases}$

② $\begin{cases} m_2 = 3\,Kg \longrightarrow F_2 = 3 \cdot 9'81 = 29'43\,N \\ L_2 = 35\,cm = 0'35\,m \end{cases}$

$19'62 = K(0'25 - L_0) \longrightarrow K = \dfrac{19'62}{0'25 - L_0}$

$29'43 = K(0'35 - L_0) \longrightarrow K = \dfrac{29'43}{0'35 - L_0}$

$$\frac{19'62}{0'25 - L_0} = \frac{29'43}{0'35 - L_0} \Rightarrow 19'62 \cdot (0'35 - L_0) = 29'43\,(0'25 - L_0)$$

$6'87 - 19'62\,L_0 = 7'36 - 29'43\,L_0$

$29'43\,L_0 - 19'62\,L_0 = 7'36 - 6'87$

$9'81\,L_0 = 0'49 \longrightarrow L_0 = \dfrac{0'49}{9'81} = 0'05\,m \simeq \underline{5\,cm}$

Escojo uno / $K = \dfrac{19'62}{0'25 - 0'05} = \underline{98'1\,N/m}$

b) $L = ? \longrightarrow m = 4\,kg \longrightarrow F_3 = 4 \cdot 9'81 = \underline{39'24\,N}$

$39'24\,N = 98'1 \cdot (L - 0'05)$

$L - 0'05 = \dfrac{39'24}{98'1} = 0'4 \qquad L = 0'4 + 0'05 = \underline{\underline{0'45\,m}}$

⑥ $v = 80\ km/h$

$\varnothing_{rueda} = 63\,cm \longrightarrow r = \dfrac{63}{2} = 31'5\,cm = \underline{\underline{0'315\,m}}$

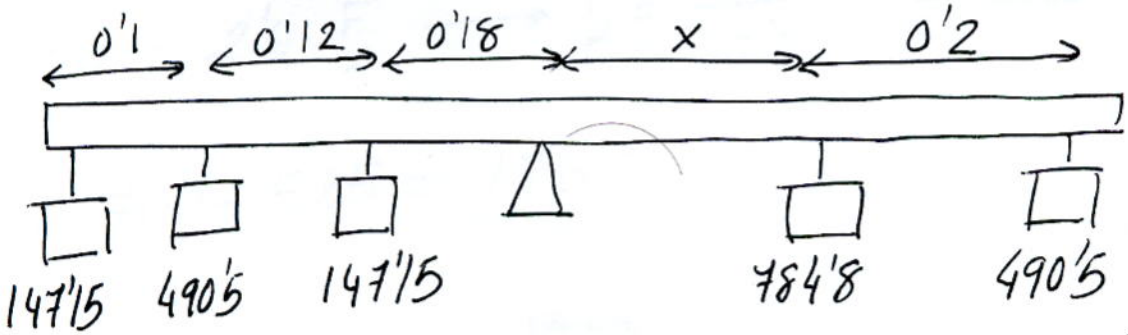
$v = 80\ \dfrac{km}{h} \cdot \dfrac{1000\,m}{1\,km} \cdot \dfrac{1\,h}{3600\,s} = 22'2\ m/s$

$v = \omega \cdot r \longrightarrow \omega = \dfrac{v}{r} = \dfrac{22'2\ m/s}{0'315\ m/r} = 70'55\ rad/s$

1 vuelta = 1 revolución = 2π radianes

$\omega = 70'55\ \dfrac{rad}{s} \cdot \dfrac{1\,rev}{2\pi\,rad} \cdot \dfrac{60\,s}{1\,min} = \underline{\underline{673'7\ r.p.m}}$

⑦



$147'15(0'1 + 0'12 + 0'18) + 490'5 \cdot (0'12 + 0'18) + 147'5 \cdot (0'18) =$

$= 784'8 \cdot x + 490'5\,(x + 0'2)$

$232'50 = 784'8 \cdot x + 490'5 \cdot x + 98'1$

$784'8x + 490'5x = 232'5 - 98'1 \qquad x = \dfrac{232'5 - 98'1}{(784'8 + 490'5)} = \underline{\underline{0'1\,m}}$