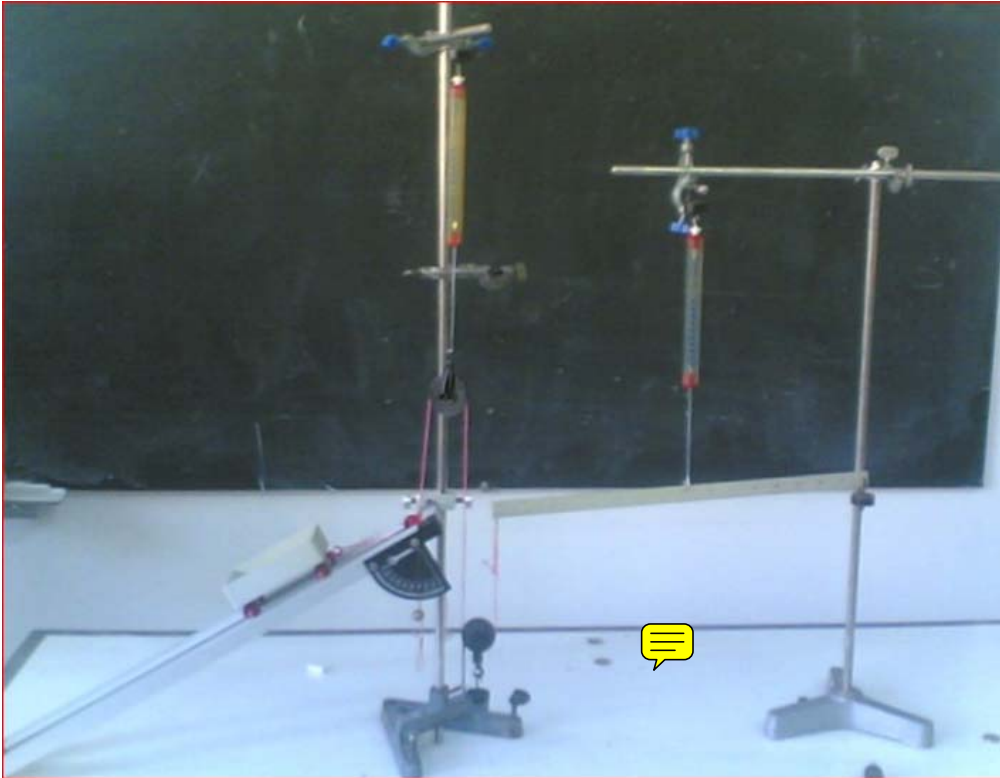


Laboratorio Equilibrare i seguenti sistemi:

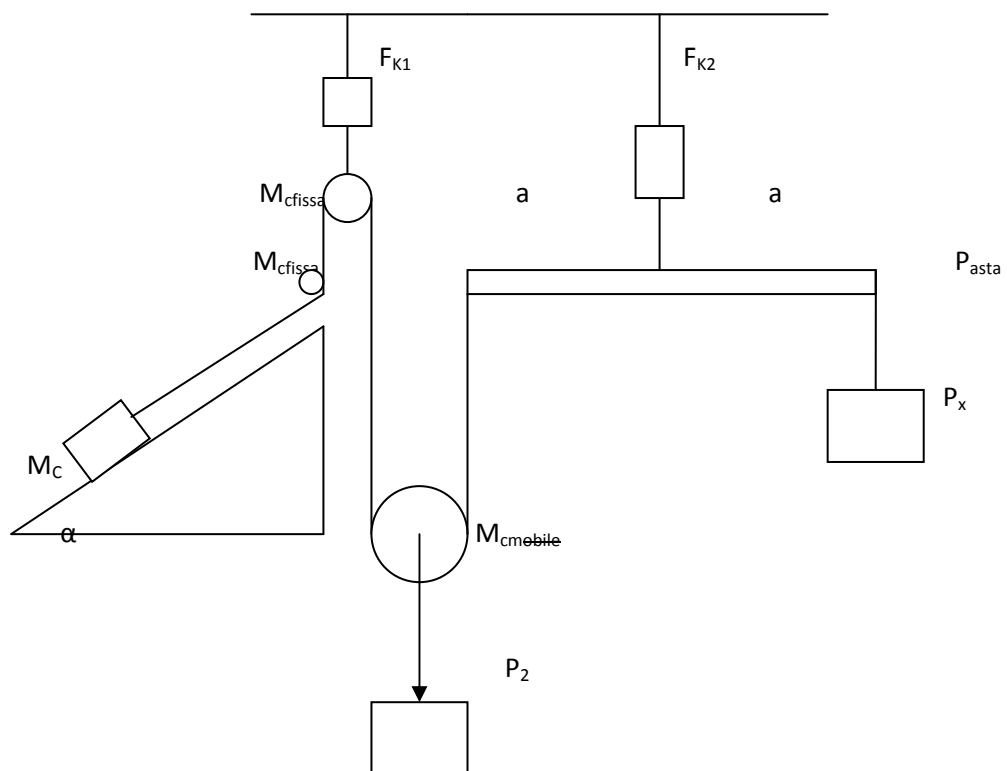
Dato il seguente sistema: Piano inclinato, carrucola fissa e carrucola mobile e leva, determinare il peso P_x da inserire per equilibrare il sistema.

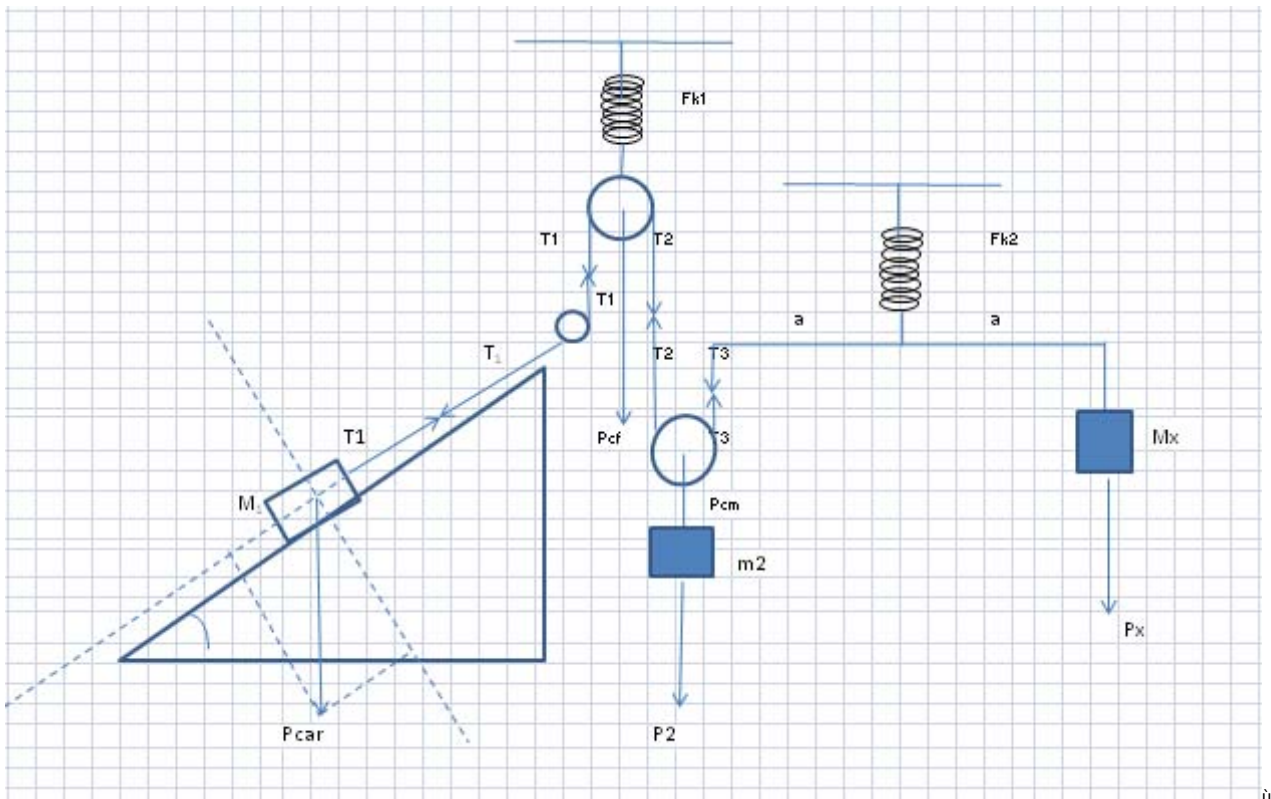
Dati sperimentali:

$$P_{\text{Asta}}=1\text{N}, \quad P_{\text{Carrello}}=0.9\text{N}, \quad P_{\text{Cmobile}}=0,7\text{N}, \quad P_{\text{Cfissa}}=0,9\text{N}, \quad P_1=0,6\text{N}, \quad \alpha=30^\circ, \quad \text{asta } a=b$$



Determinare il peso P_x da inserire sull'asta, se $a=b$, per equilibrare il sistema





Dati

Past=1N
Pcm=0,7N
Pcf=0,7N
Pcar=0,9N
m ₁ =0,5N
m _x =0,6N
α=30°

- Piano Inclinato Sistema 1

$$P_{Car//} = P_{Carr} \sin \alpha = 0,9N \sin (30) = 0,45N$$

- Prima carrucola Fissa

$$T_1 = T_1 \quad T_1 = 0,45N$$

- Seconda Carrucola fissa

$$T_2 = T_1 \quad T_2 = 0,45N$$

$$F_{K1} = T_1 + T_2 + P_{CarrFissa} = 0,45N + 0,45N + 0,7N = 1,6N$$

- Terza carrucola mobile

$$T_3 * 2r - (P_{carrMobile} + P_2) r = 0$$

$$T_3 = (P_{cMob} + P_2) / 2 = (0,7N + 0,5N) / 2 = 0,6N$$

- Asta

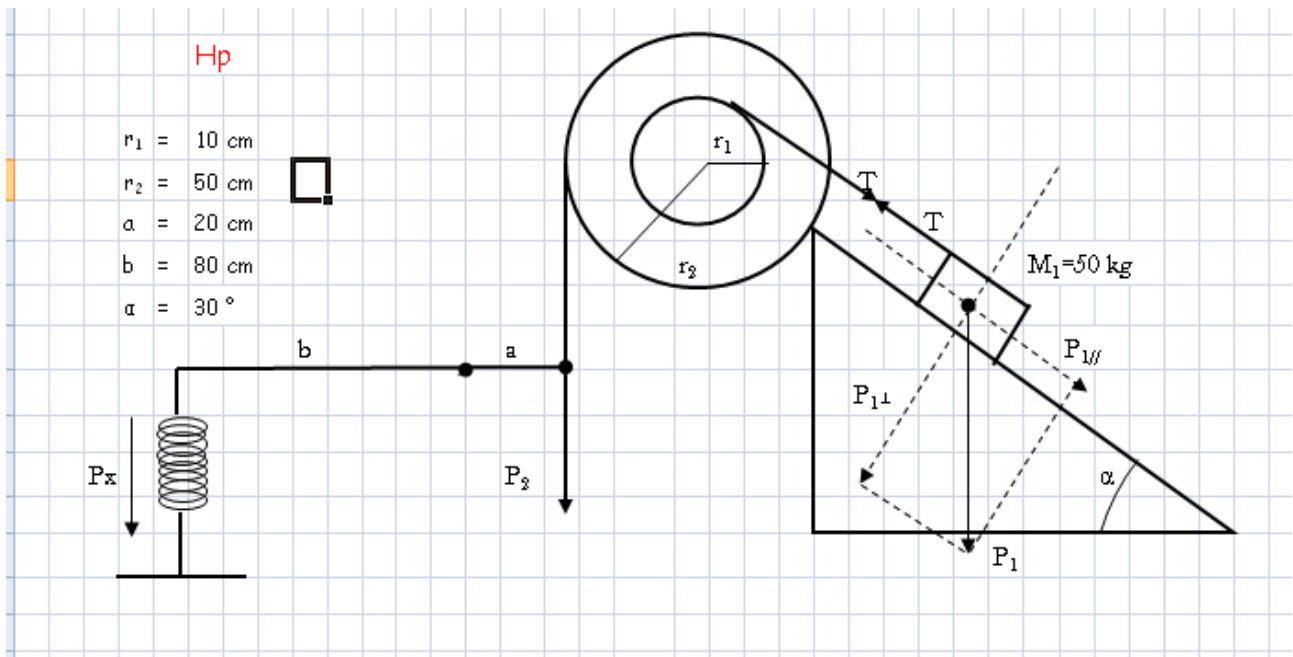
$$T_3 a = P_x b \quad a = b$$

$$T_3 = P_x \quad P_x = 0,6N$$

Se a = 10cm b = 29cm

$$P_x = T_3 a / b = 0,6N \cdot 10cm / 29cm = 0,207N = 0,21N$$

Equilibrare il seguente sistema:



- Sistema 1 Piamo inclinato

$$P_{1//} = M_1 g \sin(30) = 50 \text{ Kg } 9,81 \text{ m/s}^2 \sin(30) = 249,23 \text{ N}$$

$$T - P_{1//} = 0 \quad T = P_{1//}$$

- Sistema Verricello

$$T \cdot r_1 = T_2 r_2 \quad T_2 = T r_1 / r_2 = 249,23 \text{ N } 0,10 / 0,20 = 124,76 \text{ N}$$

- Leva

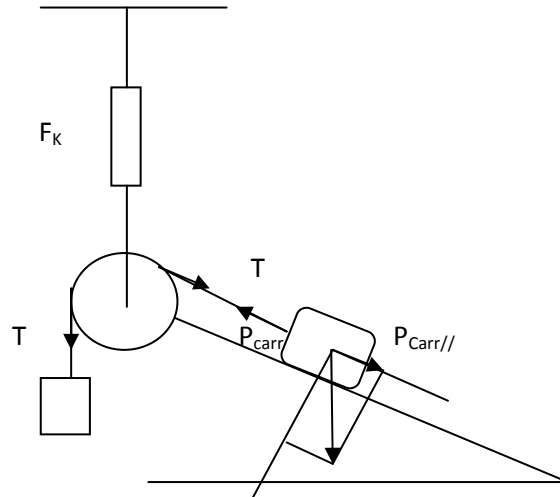
$$F_k b = T_2 a \quad F_k = T_2 a / b = 124,76 \text{ N } 0,2 / 0,8 = 31,19 \text{ N}$$

Se $K = 100 \text{ N/m}$

$$\Delta x = F_k / K = 31 \text{ cm}$$

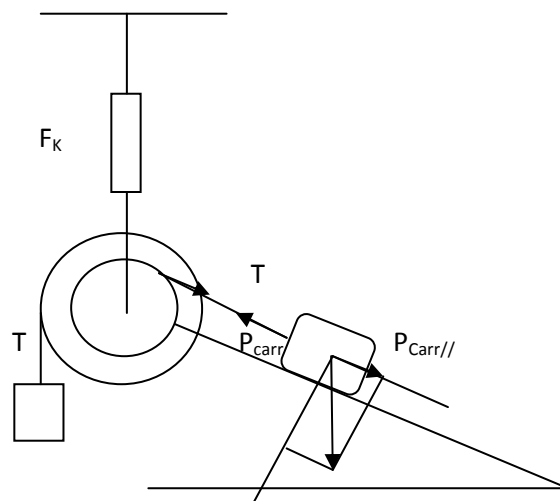
Esperimento: Piano inclinato carrucola

$P_{Carr} = 0,9N$ $P_{carrfissa} = 0,7N$ inclinazione piano 30°



Dati: $P_{carr} = 0,9 N$ $P_{carrfissa} = 0,7N$ $P_{carr//} = 0,9N \sin(30) = 0,45N$

$F_k = 2T + P_{carrfissa} = 0,45N + 0,45N + 0,7N = 1,6N$

Esperimento: piano inclinato verricello

Dati:

$P_{Carr} = 0,9N$ $P_{carrfissa} = 0,7N$ inclinazione piano 30° $r_1 = 10cm$ $r_2 = 40cm$

$$P_{\text{carr//}} = 0,9\text{N} \sin(30) = 0,45\text{N}$$

$$P_{\text{carr//}} r_1 = T_2 r_2 \quad T_2 = P_{\text{carr//}} r_1 / r_2 = 0,113\text{N} \quad P = 0,113\text{N}$$

$$F_K = P + P_{\text{carrf}} + T = 0,113\text{N} + 0,45\text{N} + 0,7\text{N} = 1,263\text{N}$$