1) (5.7) a) $T_A \operatorname{Sen} 30 + T_B \operatorname{Sen} 45 = W$ (i) $\quad / \quad T_A \operatorname{Cos} 30 - T_B \operatorname{Cos} 45 = 0$ (ii)

(i) ∗ (ii) $= T_A (\operatorname{Sen} 30 + \operatorname{Cos} 30) = W \Rightarrow \quad T_A = \frac{W}{1,36} = 0,73\,W$

de (ii): $T_B = \frac{T_A \operatorname{Cos} 30}{\operatorname{Cos} 45} = 0,89\,W$

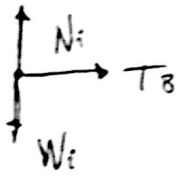
b) $-T_A \operatorname{Cos} 60 + T_B \operatorname{Sen} 45 = W$ (i) $\quad / \quad T_A \operatorname{Sen} 60 - T_B \operatorname{Cos} 45 = 0$ (ii)

(i) ∗ (ii) $T_A (\operatorname{Sen} 60 - \operatorname{Cos} 60) = W \Rightarrow \quad T_A = \frac{W}{(\operatorname{Sen} 60 - \operatorname{Cos} 60)} \Rightarrow T_A = 2,73\,W$

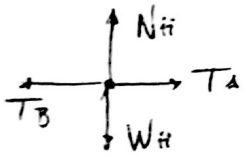
de (ii) $T_B = \frac{T_A \operatorname{Sen} 60}{\operatorname{Cos} 45} \Rightarrow T_B = 3,35\,W$

5) (5.14) a) $F_T = M_T a \rightarrow \quad a = \frac{F_T}{M_T} = \frac{125\,N}{(30+20+10)\,Kg} = 2,08 \frac{M}{S^2}$

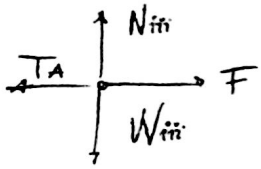
b) (i)



(ii)



(iii)



$T_B = M_i a = 30\,kg\,(2,08 \frac{M}{S^2})$

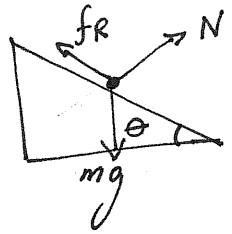
$T_B = 62,5\,N$

$/ \quad T_A - T_B = M_{ii} a$

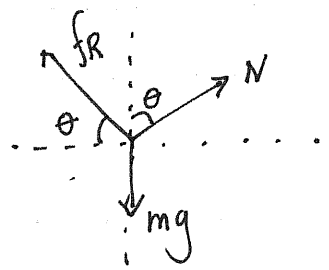
$\Rightarrow T_A = (20\,kg)(2,08 \frac{M}{S^2}) + 62,5\,N$

$T_A = 104,2\,N$

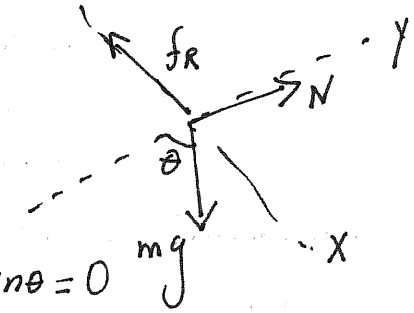
(5.25) Posición de Trèndelebburg



Para hallar el ángulo límite, suponemos el caso para el cual el paciente justo comienza a deslizar:



Rotemos mejor los ejes →



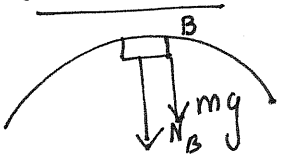
$$\Sigma F_x = -\mu_s N + mg\sin\theta = 0$$

$$\Sigma F_y = N - mg\cos\theta = 0$$

Entonces: $N = mg\cos\theta \Longrightarrow -\mu_s mg\cos\theta + mg\sin\theta = 0$

$$\Longrightarrow \tan\theta = \mu_s \Longrightarrow \theta = \tan^{-1}\mu_s \Longrightarrow \boxed{\theta = 50.19^\circ}$$

(5.42) Dinámica del Movimiento Circular

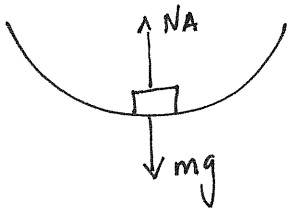


$$-N_B - mg = -\frac{mv^2}{R} \Longrightarrow v = \left(\frac{N_B R + mgR}{m}\right)^{1/2} =$$

$$\left[\frac{(6\,N \times 5\,m) + (0.8Kg)(9.8\,\frac{m}{s^2})(5m)}{0.8Kg}\right]^{1/2}$$

$$= 9.3\ m/s$$

$$N_A - mg = \frac{mv^2}{R}$$



Como la velocidad es constante:

$$N_A = m\left(\frac{v^2}{R} + g\right) = (0.8Kg)\left(\frac{86.5\,m^2/s^2}{5\,m} + 9.8\,\frac{m}{s^2}\right)$$

$$\therefore \boxed{N_A = 21.68N}$$