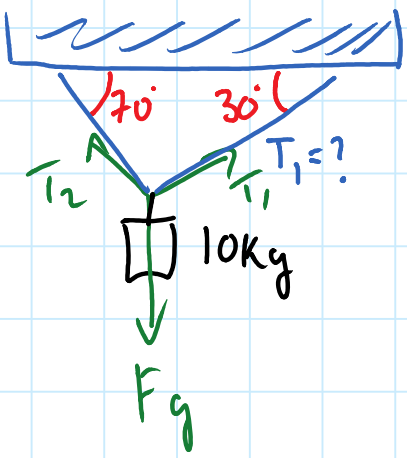
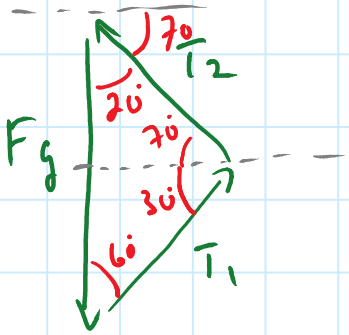
Tuesday, March 14, 2017 12:42 PM

A Quick Review

1)

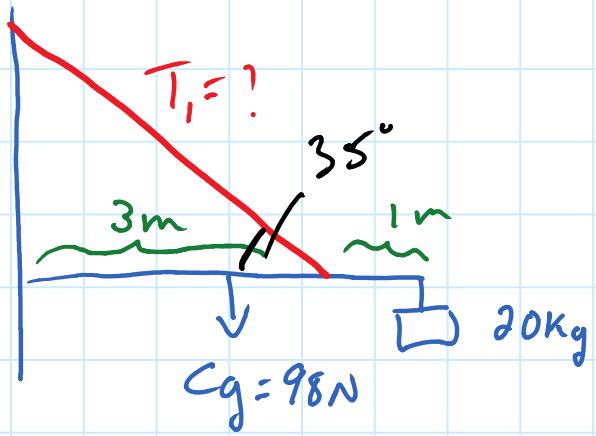




$$\frac{T_1}{\sin 20^\circ} = \frac{F_g}{\sin 100^\circ}$$

$$T_1 = 34N$$

2)

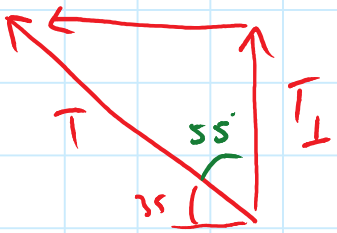


$\Sigma\tau = 0$ $\quad CW\tau = CCW\tau$

$$C_g(2) + F_g(4) = T_1(3m)$$

$$98(2) + 196(4) = T_1(3)$$

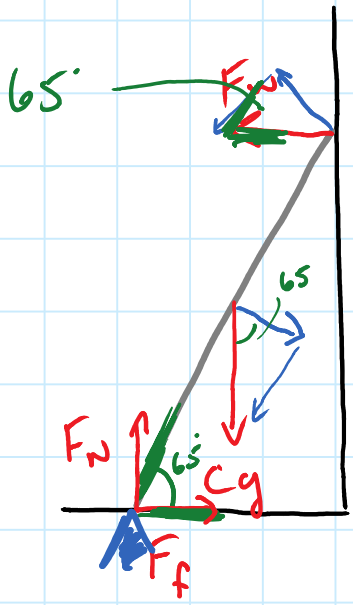
$$T_1 = 327N$$



$$\cos 55^\circ = \frac{T_1}{T}, \quad T = \frac{327}{\cos 55^\circ}$$

$$T = 570N$$

Ladder Problem



A 4m, 10 kg ladder is leaned against a frictionless wall. Determine the minimum μ between the ladder & the floor

$F_f = \mu F_N$, $\mu = \frac{F_f}{F_N}$ $\Big\} = \frac{22.8}{98} = 0.23$

$\sum F_x = 0$, $\sum F_y = 0$ $\quad \sum \tau = 0$

$F_L = F_R$ $\quad F_{up} = F_{down}$ $\quad CW\tau = CCW\tau$

$F_w = F_f$, $F_N = C_g$ $\quad C_{g_\perp}(2) = F_{w_\perp}(4)$

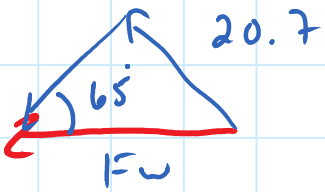
$22.8 = F_f$ $\quad F_N = 98\,N$ $\quad (41.4)(2) = F_{w_\perp}(4)$

$C_{g_\perp} = C_g \cos 65°$

$= 98 \cos 65°$

$= 41.4\,N$

$F_{w_\perp} = 20.7\,N$



$\sin 65 = \frac{20.7}{F_w}$, $F_w = 22.8\,N$