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27.

$m_1 = 145\,g$

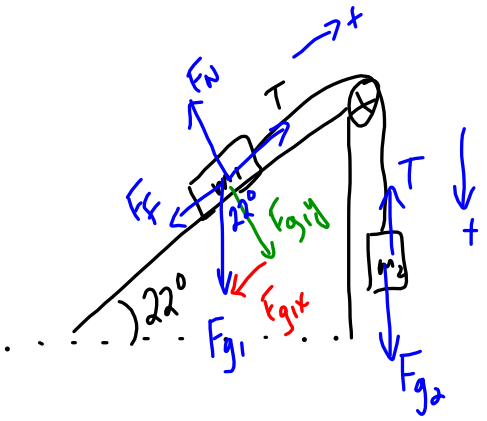
$m_2 = 85\,g$

$\mu_k = 0.18$

$\theta = 22^\circ$

a) $v_2 = ?$ after 2.5s

b) $T = ?$



To check if m_1 goes up hill, we need to see if $F_g > F_f$ and F_{g1x}

$F_{g2} = (0.085\,kg)(9.81\,m/s^2) = 0.83385\,N$

$F_{g1x} = m_1 g \sin\theta = (0.145\,kg)(9.81\,m/s^2)\sin 22^\circ = 0.5329\,N$

$F_f = \mu F_N = \mu m_1 g \cos\theta = (0.18)(0.145\,kg)(9.81\,m/s^2)\cos 22^\circ$

$= 0.2374\,N$

0.7703N

Consider m_1:

$\vec{F}_{net} = m\vec{a}$

$T - (F_f + F_{g1x}) = m_1 a$

$T - 0.7703\,N = (0.145\,kg)a$

Consider m_2:

$\vec{F}_{net} = m\vec{a}$

$F_{g2} - T = m_2 a$

$0.83385\,N - T = (0.085\,kg)a$