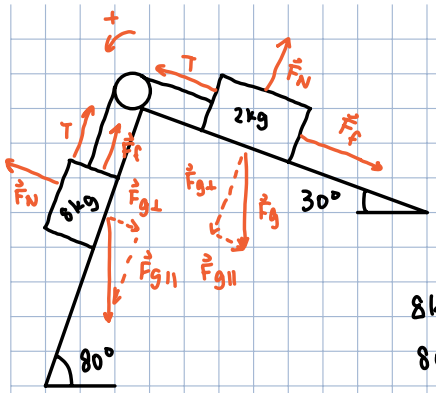


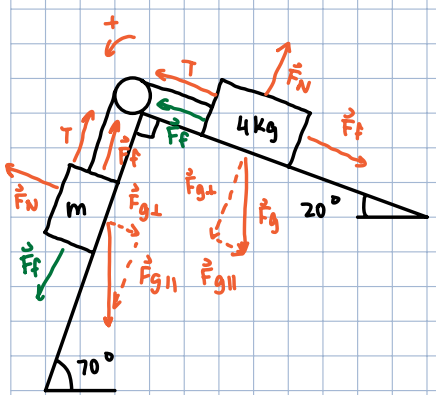
Find the smallest μ so that blocks don't move

	cos ⊥	sin ∥
8kg, 80°	$\vec{F}_{Net} = \vec{F}_N + \vec{F}_{g\perp}$ $8(0) = \vec{F}_N + 8(9.81)\cos 80$ $\vec{F}_N = 13.6\,N$ ["U"]	$\vec{F}_{Net} = T + \vec{F}_f + \vec{F}_{g\parallel}$ $8(0) = -T - 13.6\mu + 8(9.81)\sin 80$ $0 = -T - 13.6\mu + 77.3$
	$\vec{F}_f = \mu\vec{F}_N$ $= 13.6\mu\,N$ [cw]	
2kg, 30°	$\vec{F}_{Net} = \vec{F}_N + \vec{F}_{g\perp}$ $8(0) = \vec{F}_N + 2(9.81)\cos 30$ $\vec{F}_N = 16.99\,N$ ["U"]	$\vec{F}_{Net} = T + \vec{F}_f + \vec{F}_{g\parallel}$ $2(0) = T - 16.99\mu + 2(9.81)\sin 30$ $0 = T - 16.99\mu - 9.81$
	$\vec{F}_f = \mu\vec{F}_N$ $= 16.99\mu\,N$ [cw]	

$0 = -T - 13.6\mu + 77.3$
$+\ 0 = T - 16.99\mu - 9.81$

$0 = -30.6\mu + 67.5$
$\mu = 2.20$

If u = 0.1, what is the smallest and largeesst value of m so that it doesn't move?

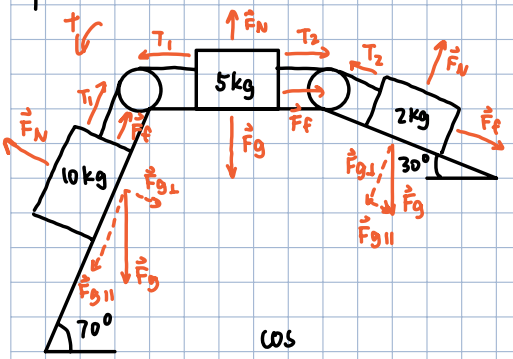


Largest:
$0 = -T + 8.88m$
$0 = -17.1 + 8.88m$
$m = 1.926\,kg$

Smallest:
$0 = -T + 9.56m$
$0 = -9.73 + 9.56m$
$m = 1.02\,kg$

	⊥	∥	∥
m	$\vec{F}_{Net} = \vec{F}_N + \vec{F}_{g\perp}$ $m(0) = \vec{F}_N + mg\cos 70$ $\vec{F}_N = mg\cos 70\,N$ ["U"]	$\vec{F}_{Net} = T + \vec{F}_f + \vec{F}_{g\parallel}$ $m(0) = -T - 0.1(mg\cos 70) + mg\sin 70$ $0 = -T - 0.336m + 9.22m$ $0 = -T + 8.88m$ (1)	$\vec{F}_{Net} = T + \vec{F}_f + \vec{F}_{g\parallel}$ $m(0) = -T + 0.336m + 9.22m$ $0 = -T + 9.56m$
	$\vec{F}_f = \mu\vec{F}_N$ $= 0.1(mg\cos 70)\,N$ [ccw]		
4kg	$\vec{F}_{Net} = \vec{F}_N + \vec{F}_{g\perp}$ $4(0) = \vec{F}_N + 4(9.81)\cos 20$ $\vec{F}_N = 36.9\,N$ ["U"]	$\vec{F}_{Net} = T + \vec{F}_f + \vec{F}_{g\parallel}$ $4(0) = T - 3.69 - 4\cdot 9.81\cdot\sin 20$ $0 = T - 17.1$	$\vec{F}_{Net} = T + \vec{F}_f + \vec{F}_{g\parallel}$ $4(0) = T + 3.69 - 4\cdot 9.81\cdot\sin 20$ $0 = T - 9.731$
	$\vec{F}_f = \mu\vec{F}_N = 0.1(36.9)$ $= 3.69\,N$ [cw]	$T = 17.1\,N$ [ccw] (2)	$T = 9.73\,N$ [ccw]

If $\mu = 0.1$, find $\vec{a}$, Tensions and $\vec{F}_{ps}$



cos ⊥ sin ∥

10kg, 70°

$\vec{F}_{Net} = \vec{F}_{g\perp} + \vec{F}_N$

$10(0) = 10(9.81)\cos 70 + \vec{F}_N$

$\vec{F}_N = 33.55\,N\,["U"]$

$\vec{F}_f = \mu\vec{F}_N$

$= 0.1(33.55)$

$= 3.36\,N[cw]$

$\vec{F}_{Net} = \vec{T}_1 + \vec{F}_{g\parallel} + \vec{F}_f$

$10\vec{a} = -T_1 - 3.36 + 10(9.81)\sin 70$

$10\vec{a} = -T_1 + 88.83$ ①

5kg

$\vec{F}_{Net} = \vec{F}_g + \vec{F}_N$

$5(0) = 5(9.81) + \vec{F}_N$

$\vec{F}_N = 49.05\,N[U]$

$\vec{F}_f = \mu\vec{F}_N$

$= 0.1(49.05)$

$= 4.91\,N[cw]$

$\vec{F}_{Net} = T_1 + T_2 + \vec{F}_f$

$5\vec{a} = T_1 - T_2 - 4.91$ ②

2kg, 30°

$\vec{F}_N = \vec{F}_{g\perp} + \vec{F}_N$

$2(0) = 2(9.81)\cos 30 + \vec{F}_N$

$\vec{F}_N = 16.99\,N["U"]$

$\vec{F}_f = \mu\vec{F}_N$

$= 0.1(16.991)$

$= 1.7\,N[cw]$

$\vec{F}_{Net} = T_2 + \vec{F}_f + \vec{F}_{g\parallel}$

$2\vec{a} = T_2 - 1.7 - 2.981\cdot\sin 30$

$2\vec{a} = T_2 - 11.5$ ③

$10\vec{a} = -T_1 + 88.83$

$+\,5\vec{a} = T_1 - T_2 - 4.91$

$+\,2\vec{a} = T_2 - 11.5$

$17\vec{a} = 88.83 - 4.91 - 11.5$

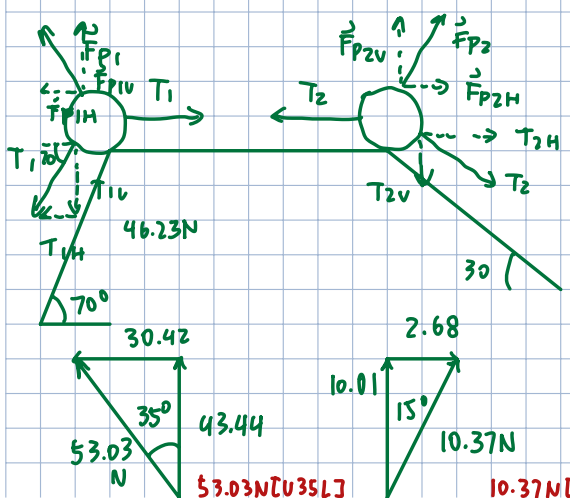
$\vec{a} = 4.26\,m/s^2\,[ccw]$

$10(4.26) = -T_1 + 88.83$

$T_1 = 46.23\,N$

$2(4.26) = T_2 - 11.5$

$T_2 = 20.03\,N$



	V	H
1	$\vec{F}_{Net} = \vec{F}_{P1V} + T_{1V}$ $0 = \vec{F}_{P1V} + 46.23\sin 70$ $\vec{F}_{P1V} = 43.44\,N[U]$	$\vec{F}_{Net} = \vec{F}_{P1H} - T_1 + T_{1H}$ $0 = \vec{F}_{P1H} - 46.23 + 46.23\cos 70$ $\vec{F}_{P1H} = 30.42\,N[L]$
2	$\vec{F}_{Net} = \vec{F}_{P2V} + T_{2V}$ $0 = F_{P2V} + 20.03\sin 30$ $\vec{F}_{P2V} = 10.01\,N[U]$	$\vec{F}_{Net} = \vec{F}_{P2H} - T_2 + T_{2H}$ $0 = F_{P2H} - 20.03 + 20.03\cos 30$ $\vec{F}_{P2H} = 2.68\,N[R]$

$53.03\,N[U35L]$ $\quad$ $10.37\,N[U15R]$

iHomework

only $999,999