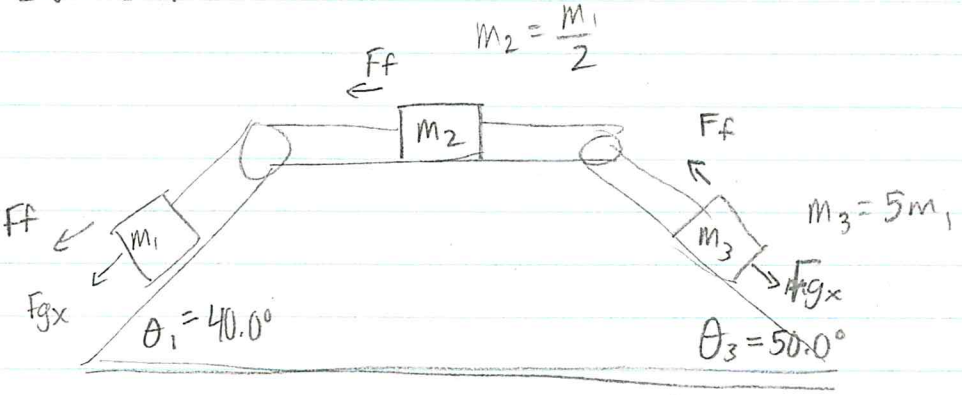
NEWTON, INCLINED, PULLEYS COLLABORATIVE ANSWER

#1.



$F_{net\ TOTAL} = m_3 g \sin\theta_3 - \mu m_3 g \cos\theta_3 - \mu m_2 g - m_1 g \sin\theta_1 - \mu m_1 g \cos\theta_1$

$(m_1 + m_2 + m_3)a = m_3 g \sin\theta_3 - \mu m_3 g \cos\theta_3 - \mu m_2 g - m_1 g \sin\theta_1 - \mu m_1 g \cos\theta_1$

$$a = \frac{m_3 g \sin\theta_3 - \mu m_3 g \cos\theta_3 - \mu m_2 g - m_1 g \sin\theta_1 - \mu m_1 g \cos\theta_1}{m_1 + m_2 + m_3}$$

$$a = \frac{5m_1(9.8)\sin 50.0 - (0.056)5m_1(9.8)\cos 50.0 - (0.056)\left(\frac{m_1}{2}\right)(9.8) - m_1(9.8)\sin 40.0 - (0.056)(m_1)(9.8)\cos 40.0}{m_1 + \frac{m_1}{2} + 5m_1}$$

$$a = \frac{28.778\ m_1}{6.5 m_1}$$

DON'T WORRY ABOUT TENSION

$a = 4.4274\ m/s^2$

$a = 4.4\ m/s^2$

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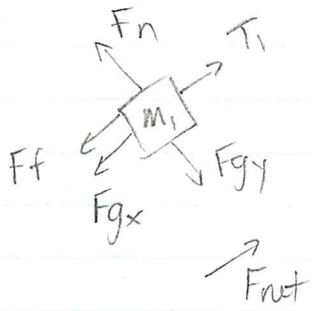
Other Solution.

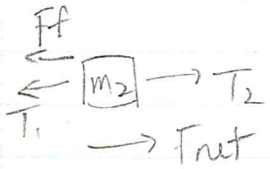


$F_{net} = T_1 - F_f - F_{gx}$

$m_1 a = T_1 - \mu F_n - m_1 g \sin\theta_1$

$m_1 a = T_1 - \mu m_1 g \cos\theta_1 - m_1 g \sin\theta_1$

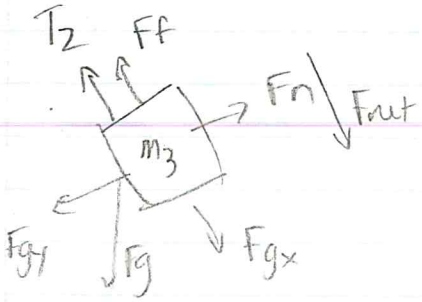
$T_1 = m_1 a + \mu m_1 g \cos\theta_1 + m_1 g \sin\theta_1$ ①



$F_{net} = T_2 - T_1 - F_f$

$m_2 a = T_2 - T_1 - \mu F_n$

$m_2 a = T_2 - T_1 - \mu m_2 g$ ②



$F_{net} = F_{gx} - F_f - T_2$

$m_3 a = m_3 g \sin\theta_3 - \mu m_3 g \cos\theta_3 - T_2$

$T_2 = m_3 g \sin\theta_3 - \mu m_3 g \cos\theta_3 - m_3 a$ ③

Sub ①, ③ into ②

$m_2 a = m_3 g \sin\theta_3 - \mu m_3 g \cos\theta_3 - m_3 a - m_1 a - \mu m_1 g \cos\theta_1 - m_1 g \sin\theta_1 - \mu m_2 g$

$m_1 a + m_2 a + m_3 a = m_3 g \sin\theta_3 - \mu m_3 g \cos\theta_3 - \mu m_1 g \cos\theta_1 - m_1 g \sin\theta_1 - \mu m_2 g$

$(m_1 + m_2 + m_3) a = m_3 g \sin\theta_3 - \mu m_3 g \cos\theta_3 - \mu m_1 g \cos\theta_1 - m_1 g \sin\theta_1 - \mu m_2 g$

NEWTON

$$a = \frac{m_3 g \sin\theta_3 - \mu m_3 g \cos\theta_3 - \mu m_1 g \cos\theta_1 - m_1 g \sin\theta_1 - \mu m_2 g}{m_1 + m_2 + m_3}$$

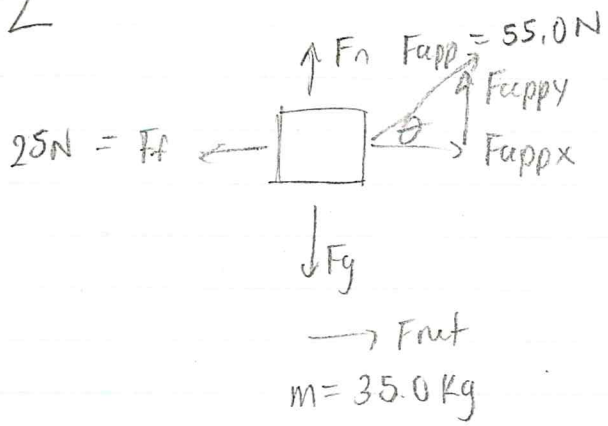
$$a = \frac{5m_1(9.8)\sin 50.0° - (0.056)5m_1(9.8)\cos 50.0° - (0.056)m_1(9.8)\cos 40.0° - m_1(9.8)\sin 40.0 - (0.056)\left(\frac{m_1}{2}\right)(9.8)}{m_1 + \frac{m_1}{2} + 5m_1}$$

$$a = \frac{28.7792 m_1}{6.5 m_1}$$

$$a = 4.4274 \text{ m/s}^2$$

$$a = 4.4 \text{ m/s}^2$$

#2



$F_{net_x} = F_{app_x} - F_f$

$ma = F_{app}\cos\theta - F_f$

$\cos\theta = \dfrac{ma + F_f}{F_{app}}$

$\theta = \cos^{-1}\left(\dfrac{(35.0)(0.15) + 25}{55.0}\right)$

$\theta = 56.633^\circ$

$\theta = 57^\circ$

$F_{net_y} = F_n + F_{appy} - F_g \quad * F_{net_y} = 0N$

$\therefore F_n = F_g - F_{app}\sin\theta$

$F_n = mg - F_{app}\sin\theta$

$= (35.0)(9.8) - (55.0)\sin 56.6$

$= 297.0834\ N \Rightarrow 3.0 \times 10^2\ N.$