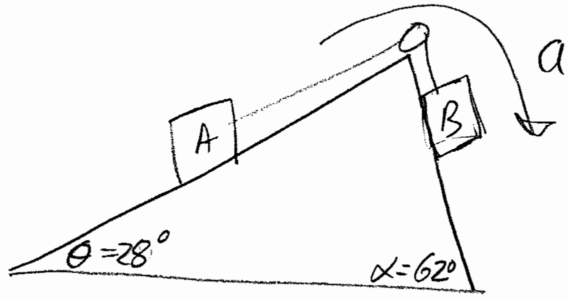
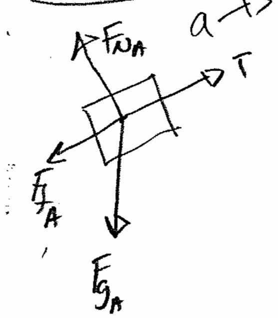


FBD (A)

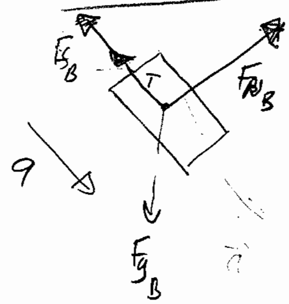


$F_{g_{A_y}} = m_A g\cos\theta$

F_{g_A}

$F_{g_{A_x}} = m_A g\sin\theta$

FBD (B)



$F_{g_{B_y}} = m_B g\cos\alpha$

$F_{g_{B_x}} = m_B g\sin\alpha$

F_{g_B}

$\vec{F}_{net_{A_x}} = \vec{T} + \vec{F}_{f_A} + \vec{F}_{g_{Ax}}$

$+m_A a = T - F_{f_A} - F_{g_{Ax}}$

$m_A a = T - \mu F_{N_A} - m_A g\sin\theta$ (1)

$\vec{F}_{net_{A_y}} = \vec{F}_{N_A} + \vec{F}_{g_{A_y}}$

$0 = F_{N_A} - F_{g_{A_y}}$

$0 = F_{N_A} - m_A g\cos\theta$

$F_{N_A} = m_A g\cos\theta$ (2)

(2) into (1)

$m_A a = T - \mu m_A g\cos\theta - m_A g\sin\theta$

$m_A a = T - m_A g(\mu\cos\theta + \sin\theta)$ (3)

$F_{net_{B_x}} = \vec{T} + \vec{F}_{f_B} + \vec{F}_{g_{B_x}}$

$-m_B a = T + F_{f_B} - F_{g_{B_x}}$

$-m_B a = T + \mu F_{N_B} - m_B g\sin\alpha$ (3)

$\vec{F}_{net_{B_y}} = \vec{F}_{N_B} + \vec{F}_{g_{B_y}}$

$0 = F_{N_B} - m_B g\cos\alpha$

$F_{N_B} = m_B g\cos\alpha$ (4)

(4) into (3)

$-m_B a = T + \mu m_B g\cos\alpha - m_B g\sin\alpha$

$-m_B a = T + m_B g(\mu\cos\alpha - \sin\alpha)$ (5)

(3) − (5)

$m_A a = T - m_A g(\mu\cos\theta + \sin\theta)$ (3)

$-m_B a = T + m_B g(\mu\cos\alpha - \sin\alpha)$ (5)

$m_A a + m_B a = 0 - m_A g(\mu\cos\theta + \sin\theta) - m_B g(\mu\cos\alpha - \sin\alpha)$

$a(m_A + m_B) = -m_A g(\mu\cos\theta + \sin\theta) - m_B g(\mu\cos\alpha - \sin\alpha)$ $\quad \mu_k = 0.26$

$$a = \frac{-m_A g(\mu\cos\theta + \sin\theta) - m_B g(\mu\cos\alpha - \sin\alpha)}{(m_A + m_B)}$$

$$a = \frac{-12(9.8)(0.26\cos(28) + \sin(28)) - 27(9.8)(0.26\cos(62) - \sin(62))}{(12+27)}$$

$a = 3.05\ m/s^2$

Find T using $a = 3.05\ m/s^2$ and Eq'n 3

$$m_A a = T - m_A g(\mu\cos\theta + \sin\theta)$$

$$T = m_A a + m_A g(\mu\cos\theta + \sin\theta)$$

$$T = m_A(a + g(\mu\cos\theta + \sin\theta))$$

$$T = 12(3.05 + 9.8(0.26\cos(28) + \sin(28)))$$

$$T = 118.9\,N$$