

$$\textcircled{1} \quad m_1 = 1600. \text{ kg}$$

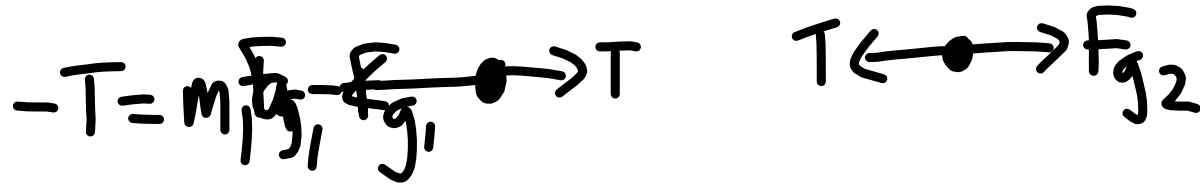
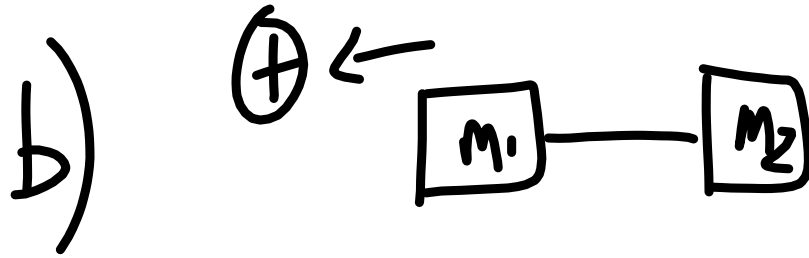
$$a) \quad m_2 = 1000. \text{ kg}$$

$$g = 9.81 \frac{\text{m}}{\text{s}^2}$$

$$a = g \frac{m_1 - m_2}{m_1 + m_2}$$

$$a = 9.81 \frac{(600)}{(2600)}$$

$$a = 2.26 \frac{\text{m}}{\text{s}^2}$$



$$\sum \vec{F}_1 = F_{g1} - T = m_1 a$$

$$\sum \vec{F} = T - F_{g2} = m_2 a$$

$$-T = m_1 a - F_{g1}$$

$$T = m_2 a + F_{g2}$$

$$T = F_{g1} - m_1 a$$

$$T = m_2 a + m_2 g$$

$$T = m_1 g - m_1 a$$

$$T_1 = (1600)(9.81) - (1600)(2.26)$$

$$T_1 = 12,080 \text{ N}$$

$$T_2 = (1000)(2.26) + (1000)(9.81)$$

$$T_2 = 12,070 \text{ N}$$

$$-T = m_1 a - F_{g_1}$$

$$F_{g_1} - T = m_1 a$$

$$m_1 g - T = m_1 a$$

$$\frac{m_1 g - T}{m_1} = a$$

$$T = m_2 a + F_{g_2}$$

$$T - F_{g_2} = m_2 a$$

$$T - m_2 g = m_2 a$$

$$\frac{T - m_2 g}{m_2} = a$$

$$\frac{m_1 g - T}{m_1} = \frac{T - m_2 g}{m_2}$$

$$(m_1 g - T)m_2 = (T - m_2 g)m_1$$

$$m_1 g m_2 - T m_2 = m_1 T - m_2 g m_1$$

$$m_1 g m_2 + m_1 g m_2 = m_1 T + T m_2$$

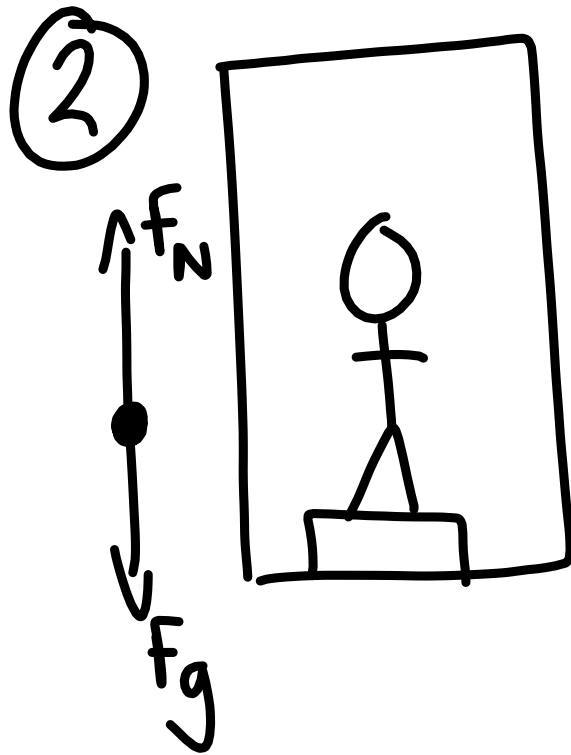
$$2 m_1 m_2 g = T (m_1 + m_2) \quad 12,000 \text{ N}$$

$$T = \frac{2 m_1 m_2 g}{m_1 + m_2} = 12,073.846$$

What if $m_1 = m_2$?

$$T = \frac{4m}{2m} g = 2 \boxed{mg}$$

weight ↑



$$\text{rest: } \sum \vec{F} = -F_g + F_N = 0$$

$$\downarrow \text{ accel } \sum \vec{F} = -F_g + F_N = Ma$$