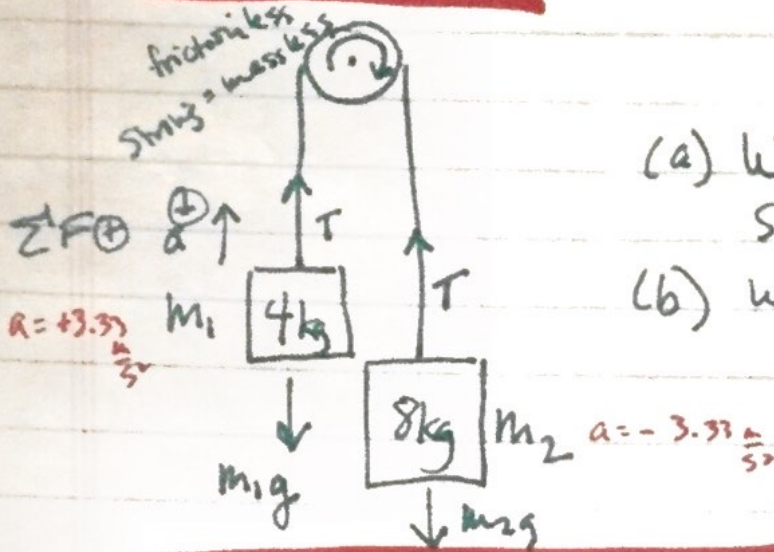


Atwood Machines - 2 hanging masses



(a) What is accel. of system?

(b) What is tension in the ropes?

$$a = \frac{(8 \times 10) - (4 \times 10)}{12} = \frac{40}{12} = 3.33 \frac{m}{s^2}$$

magnitude

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

Where did this come from?

① Look at 8 kg mass $\Sigma F \ominus$ down $a \downarrow$

$$\Sigma F_y = T - m_2 g$$

$$m_2 a = T - m_2 g$$

$$T = m_2 g + m_2 a = (8 \times 10) + (8 \times -3.33)$$

$$= 106.6 \text{ N}$$

② Look at 4 kg mass $\Sigma F_y = T - m_1 g$

$$m_1 a = T - m_1 g$$

set =

$$T = m_1 a + m_1 g$$

$$m_2 g - m_2 a = m_1 a + m_1 g$$

$$m_2 g - m_1 g = m_1 a + m_2 a \quad a = ?$$

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