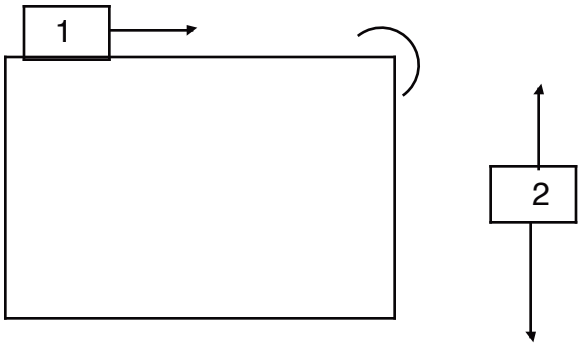
Single Body Analysis #1

Var	Given value	Units	Description
g	10	$\frac{m}{s^2}$	acceleration due to gravity
m_1	6	kg	mass 1
m_2	4	kg	mass 2
a		$\frac{m}{s^2}$	acceleration of system
T		N	Tension



$$m_2 g - T = m_2 a$$

$$T = m_1 a$$

$$m_2 g = (m_1 + m_2) a$$

Single Body Analysis #1 (continued)

$$m_2 g = (m_1 + m_2) a$$

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

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

$$= \frac{(6\,\text{kg})\left(10\,\frac{\text{m}}{\text{s}^2}\right)}{(4\,\text{kg}) + (6\,\text{kg})}$$

$$= \boxed{6\,\frac{\text{m}}{\text{s}^2}} \quad \checkmark$$

$$T = m_1 a$$

$$= (4\,\text{kg})\left(6\,\frac{\text{m}}{\text{s}^2}\right)$$

$$= \boxed{24\,\text{N}} \quad \checkmark$$