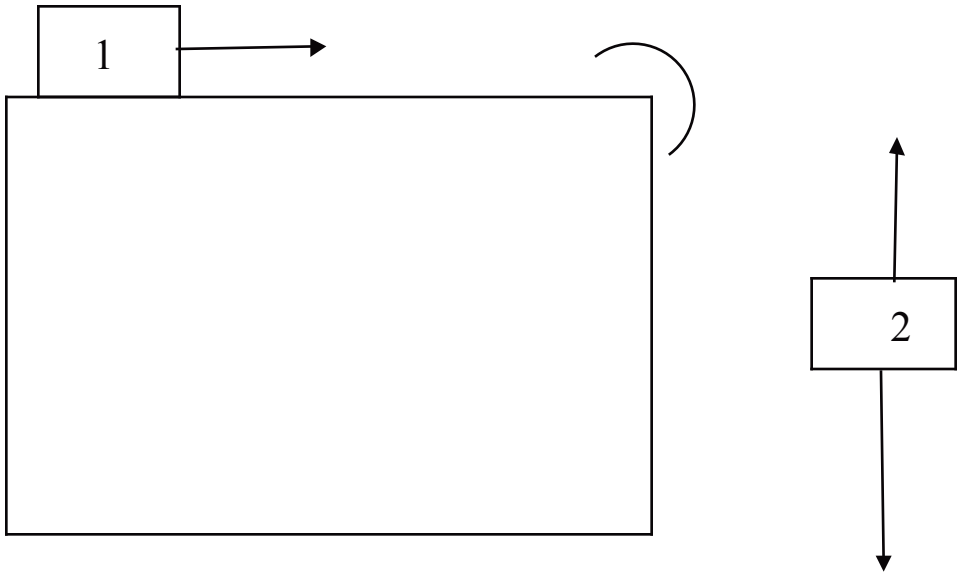
Single Body Analysis #1



$$m_2 g - F_{T1,2} = m_2 a$$

$$F_{T1,2} = m_1 a$$

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

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

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

Single Body Analysis #1 (continued)

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

$$= \frac{(50\,\text{kg})\left(10\,\frac{\text{m}}{\text{s}^2}\right)}{(100\,\text{kg}) + (50\,\text{kg})}$$

$$= \boxed{3.33\,\frac{\text{m}}{\text{s}^2}}$$ ✓

$$F_{T1,2} = m_1 a$$

$$= (100\,\text{kg})\left(3.33\,\frac{\text{m}}{\text{s}^2}\right)$$

$$= \boxed{333.\,\text{N}}$$ ✓

Single Body Analysis #1 (continued)

Var	Given value	Units	Description
g	10	$\frac{m}{s^2}$	acceleration due to gravity
m_1	100	kg	mass 1
m_2	50	kg	mass 2
a		$\frac{m}{s^2}$	acceleration of system
$F_{T1,2}$		N	Tension