Two masses of 7kg and 3 kg respectively hanging on pulley. Calculate acceleration due to gravity.

Answer on Question#36741 - Physics - Mechanics

The net force acting on the system is the difference between weights of two objects:

$$F_{net} = W_1 - W_2 = m_1 g - m_2 g = (m_1 - m_2)g,$$

where $m_1 = 7\ kg, \mathrm{m}_2 = 3\ kg, g = 10\frac{m}{s^2}$.

Total mass of the system

$$M = m_1 + m_2.$$

According to the Newton's second law acceleration due to gravity is

$$a = \frac{F_{net}}{M} = \frac{(m_1 - m_2)g}{m_1 + m_2} = 10\frac{m}{s^2} * \frac{7-3}{7+3} = 4\frac{m}{s^2}.$$

Answer: $4\frac{m}{s^2}$.