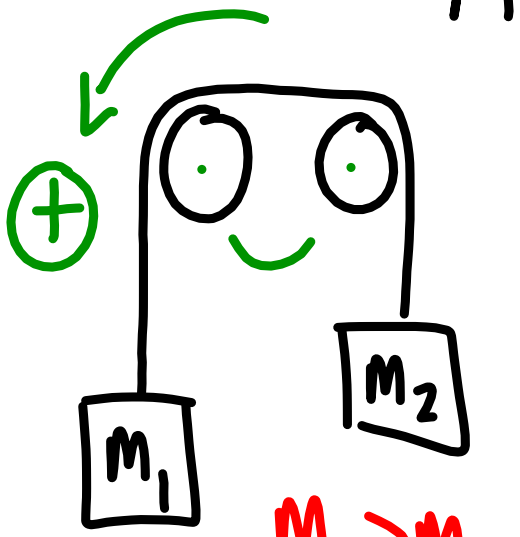
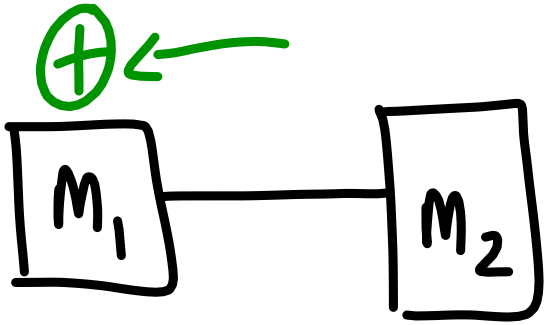
Atwood's Machine



$m_1 > m_2$

or



$$\Sigma \vec{F}_1 = F_{g_1} - T = m_1 a \rightsquigarrow -T = m_1 a - F_{g_1}$$

$$\Sigma \vec{F}_2 = T - F_{g_2} = m_2 a \qquad T = F_{g_1} - m_1 a$$

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

$$m_2 a + F_{g_2} = F_{g_1} - m_1 a$$

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

$$m_2a + m_2g = m_1g - m_1a$$

$$m_2a + m_1a = m_1g - m_2g$$

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

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