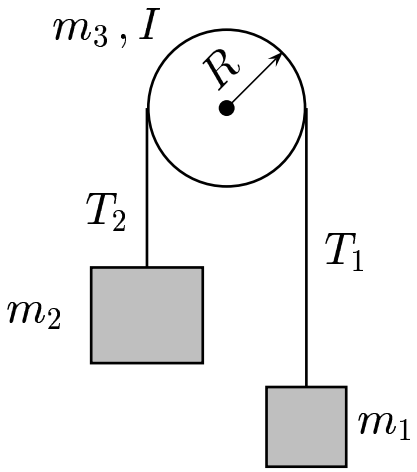
Consider the Atwood Machine shown in the sketch. The pulley has a radius R and the moment of inertia I and $m_2 > m_1$. Since there are three moving objects, there should be three equations of motion. Two of them are $T_1 - m_1\, g = m_1\, a$ and $m_2\, g - T_2 = m_2\, a$.



What is the third equation?

A) $(T_2 - T_1)\, R = \dfrac{I\, a}{2\, R}$.

B) $(T_2 - T_1)\, R = \dfrac{I\, R}{2\, a}$.

C) $(T_2 - T_1)\, R = \dfrac{I\, a}{R}$.

D) $(T_2 - T_1)\,R = \dfrac{I\,R}{a}\,.$

The equation of motion for the pulley is $\tau = I\,\alpha$, where $\alpha = \dfrac{a}{R}$.

Notice that since m_2 is descending, T_2 should be greater than T_1,

Answer **C**.