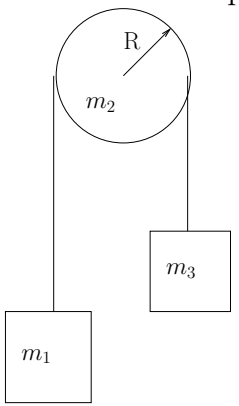
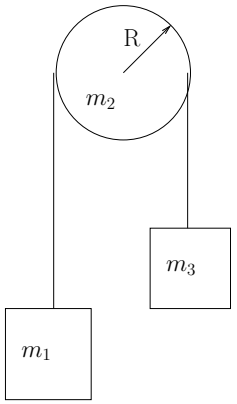
In the diagram below $m_1 = 15$ kg, $m_2 = 20$ kg, $m_3 = 20$ kg, and $R = 0.5$ m. How fast is m_2 moving if it falls 1 m from its initial position?



In the diagram below $m_1 = 15$ kg, $m_2 = 20$ kg, $m_3 = 20$ kg, and $R = 0.5$ m. What is the acceleration of the objects?



Consider a hollow sphere rolling down an incline plane with a 45 degree angle to the horizon. If the sphere has a mass of 0.1 kg and a radius of 0.1 m, what is the acceleration on the sphere if it rolls without slipping?

Calculate the cross product $\vec{A} \times \vec{B} = \vec{C}$ where $\vec{A} = 3\hat{i} + 4\hat{j}$ and $\vec{B} = 1\hat{k}$.