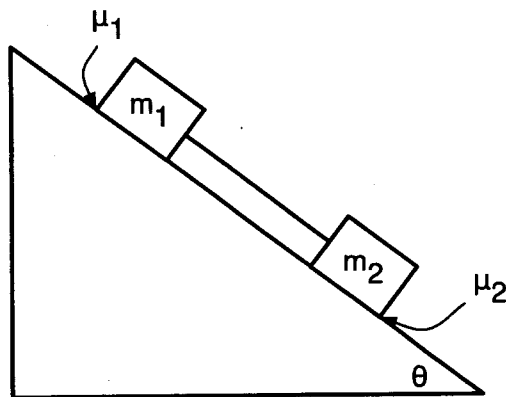


QP48

Blocks on an Incline

Two masses connected by a string slide down a ramp making an angle θ with the horizontal, as shown in the figure below. The mass m_1 has a coefficient of kinetic friction μ_1 and the mass m_2 has a coefficient of kinetic friction μ_2 . Assume the string is massless and remains taut as the masses slide down the incline.



- (4 points)** Draw the free body diagrams for both masses, showing the forces acting on each as they slide down the ramp. Write down the equations of Newton's Second Law for both m_1 and m_2 .
- (4 points)** Find the acceleration a of the masses and the tension T of the string. Give your answers in terms of m_1 , m_2 , μ_1 , μ_2 , g and θ .
- (2 points)** Find the condition on μ_1 and μ_2 such that the string indeed remains taut as the masses slide down the incline.