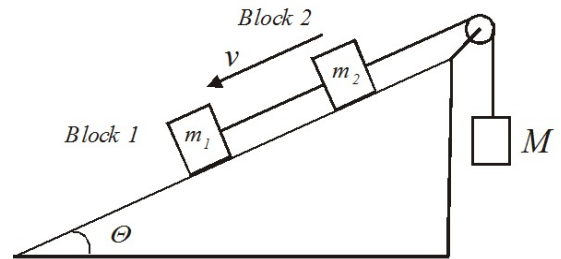
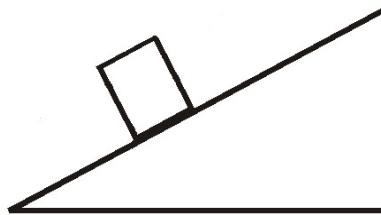


Name: _____

1. Blocks 1 and 2 of masses m_1 and m_2 , respectively, are connected by a light string, as shown. These blocks are further connected to a block of mass M by another light string that passes over a pulley of negligible mass and friction. Blocks 1 and 2 move with a constant velocity v down the inclined plane, which makes an angle θ with the horizontal. The kinetic frictional force on block 1 is f and that on block 2 is $2f$.



- (a) On the figure below, draw and label all the forces on block m_1 .



Express your answers to each of the following in terms of m_1 , m_2 , g , θ , and f

- (b) Determine the coefficient of kinetic friction between the inclined plane and block 1.

- (c) Determine the value of the suspended mass M that allows blocks 1 and 2 to move with constant velocity down the plane.

- (d) The string between blocks 1 and 2 is now cut. Determine the acceleration of block 1 while it is on the inclined plane.

2. Two 10.0 kg masses are hanging from the ceiling of an elevator that is accelerating upward at 2.00 m/s^2 . What is the tension in each rope?

3. A 250.0 kg crate is being pulled across the floor at a constant speed with a rope that makes an angle of 22.0° to the horizontal. If the force applied is equal to 875 N, what is the coefficient of kinetic friction?

4. In the ramp system shown, a 7.00 kg mass is attached to a 6.50 kg mass by a light string that is threaded through a low friction pulley. The 7.00 kg mass accelerates up the ramp when the 6.50 kg mass is released. (a) Draw a FBD for each object and (b) find the acceleration of the system if the coefficient of kinetic friction between the 7.00 kg mass and the plane is 0.280.

