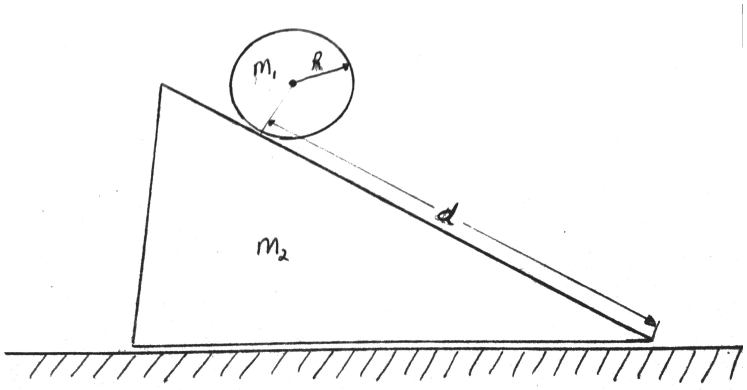
PHYS425: In-class worksheet #1

Name: _____

Partners Name: _____

This worksheet is to introduce the idea that scalar quantities are easier to work with than vectors. Because we are physicist, we like making all comparisons quantitative. So if possible (Using your phones, or just the wall clock) time youselves with these problems.



A cylinder of mass m_1 and radius R is place a distance d up a wedge of mass m_2 that makes an angle θ with the level ground. The rolls without slipping upon the wedge, and the wedge slides without friction upon the ground.

1. We have enough information to find the forces acting upon the block and the wedge. Use Newton's second and third laws find the equations that describe the positions of the block and wedge at some future time t. When does the block begin to leave the wedge? (Remember to time yourselves with these problems).

2. Now use the conservation of energy and momentum to describe the positions of the block and the wedge at some future time t. When does the block begin to leave the wedge?