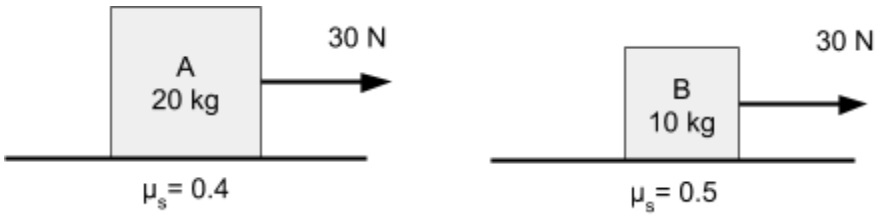
PAL Problem Set 10 for Phys 5A (Forces and Newton's Laws III)

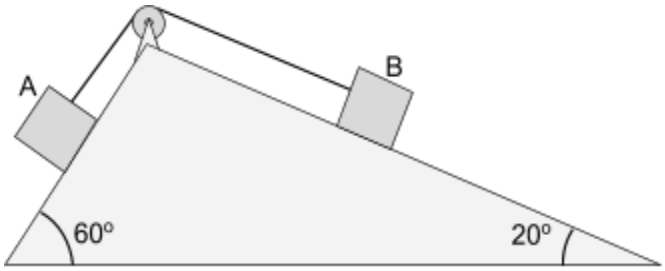
Always explain your answers and show your work.

1. Two boxes A and B remain at rest. How do the forces of friction acting on boxes A and B compare?

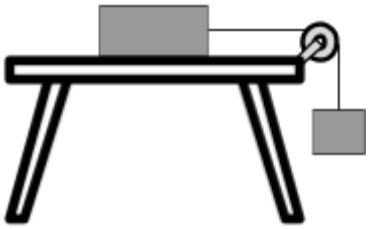


2. Can the normal force on an object be directed downward? If not, why not? If so, provide an example.

3. The two blocks A and B are at rest on frictionless surfaces. Block B has mass *m*. What is the mass of block A?



4. Two blocks are tied together by a rope draped over a pulley as shown in the figure.



   A. At first, the block on the table does not slip. How does the tension in the rope compare to the weight of the hanging block?

   B. You tip the table a bit so that the block on the table starts to slip and the two blocks start to accelerate. How does the tension in the rope compare to the weight of the hanging block?

5. Two blocks are tied together by a rope draped over a pulley as shown in the figure for question 4. Now let's assume that the block on the table has mass *2m* and that the hanging block has mass *m*. The coefficients of kinetic and static friction between the table and the 2m block are 0.3 and 0.4 respectively. Do the blocks accelerate? If so, calculate this acceleration.