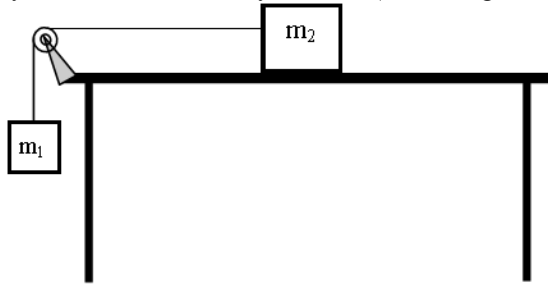


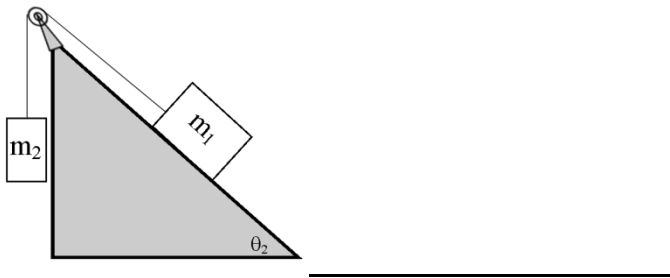
## Advanced Force Problems 4

### Solve the following problems

1. Block 1 has a mass of 4 kg and is cube with side 0.4 m. Block 2 has a mass of 6kg and is a cube with sides 0.6 m. If the coefficient of friction for block 2 is 0.3, and this scenario happens in a room that is 15° C, what is the acceleration of the system when the velocity is 2m/s? (Don't forget to calculate the air resistance of each box)



2. Block 1 has a mass of 24 kg. Its dimension are 2x3x4 dm. The coefficient of friction is 0.35. Its 2x3 dm face is pointed up and down the 40 degree incline. Block 2 has the dimensions of 1x2x3 dm. If block 2 has its smallest face pointed up and down, what is the mass of block 2 if the acceleration of the system is 1.5 m/s<sup>2</sup> down the incline when the velocity is 4m/s? The temperature is 20° C. Based on the mass for block 2, what is its density?



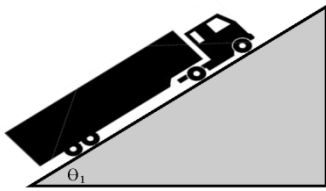
Name: \_\_\_\_\_

Mr. Croom's Physics

Date: \_\_\_\_\_

Chapter 4: Force and the Law of Motion

3. A cab-over tractor and trailer try to climb at  $20^\circ$  incline. The mass of the truck is 90,000 lbs. If the tires are rubber on dry concrete, and the truck is 8'6" wide, 14' high, and 65' long. The air temperature is  $77^\circ$  F. What force must the engine produce to move this vehicle up the hill with  $a=0$  and  $v=45$  mph? Assume the truck is a long cylinder.



4. A person pulls a 50 cm per side cube that has a pressure of 40 Pa on the floor with 81 N and  $30^\circ$ . The room temperature is  $20^\circ$  C. The coefficient of kinetic friction is 0.65. What is the acceleration of the box when  $v=3$  m/s? If there were no air resistance what would the acceleration be? If there were no air resistance or friction what would the acceleration be?

