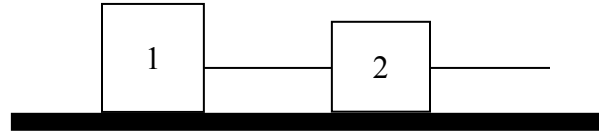


A1. Explain Inertia. (10)(RO)

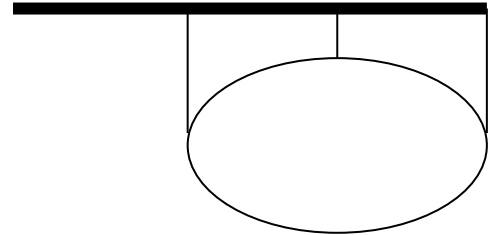
A2. A block of mass 6.50 kg is sitting on an incline of 37.0° to the horizontal in elevator that is accelerating upwards at 0.780 m/s^2 . What is the coefficient of static friction between the block and the incline if the block is not sliding down the incline? (40)

A3. Roger came after school to do one final trial with the Atwood lab. He put 125 grams on one side of the machine and 75.0 grams on the other side. What value did he find for the acceleration of the system? (20)



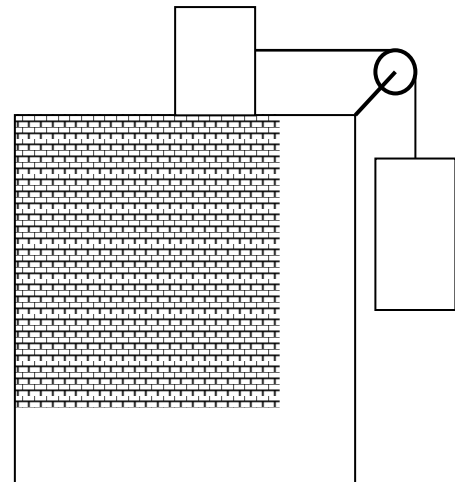
A4. Two blocks are connected by a light string and pulled across a rough table at a constant speed as shown. The coefficient of friction between block 1 and the table is 0.332 and between block 2 and the table is 0.565. What is the tension in the cord connecting the two blocks if block 1 has a mass of 4.45 kg and block 2 has a mass of 2.88 kg? (20)

A5. A 2.00 m wide sign of mass 4.25 kg hangs from three equally placed chains as shown to the right. What is the tension in each of the strings? (10)



A6. Meryl is out one winter morning shoveling her driveway so she can get to school. She pushes the 0.500 kg shovel across the driveway by applying a force of 28.5 N down on the handle which makes an angle of 40.0° to the vertical. What is the retarding force of the snow if she slows down at a rate of 0.45 m/s^2 ? (20)

A7. Three boxes are stacked on top of each other on an incline of 38.0° to the horizontal. The boxes have masses of 9.00 kg, 12.0 kg and 8.00 kg measuring from the top to the bottom. What is the required coefficient of friction between each box and the other boxes or the incline so that none of them slide? (20)



B1. What is the acceleration of the system shown here if the hanging mass has twice the mass of the other? (20)

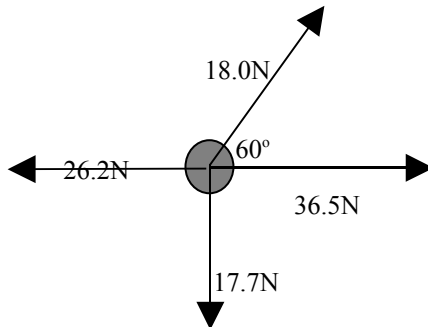
B2. Explain using concepts from this chapter why or why not there should be different weight divisions in the sport of down hill skiing. The use of mathematics can help support your position. (20)(RO)

B3. Jun, mass 60.0 kg, is participating in his favorite sport of water ski jumping. He uses a ramp with an angle of 38.0° to the water and a final height of 2.00 m above the water. His skis have a coefficient of friction with the ramp of 0.445. On his last jump he landed 18.0 m from the end of the ramp. What was his speed just before going up the ramp on this jump? (40)

B4. A small box is held in place against a rough wall by someone pushing on it with a force directed upward at 28.0° above the horizontal. The coefficients of static and kinetic friction between the box and wall are 0.65 and 0.30, respectively. The box slides down unless the applied force has magnitude 24 N. What is the mass of the box? (20)

B5. One weekend Ed went into Boston to ride various elevators in the tall buildings. He took his trusty bathroom scale along to help measure his acceleration. What was his acceleration when his scale read 1.32 times what it registered at home that morning? (10)

B6. Find the net force on the rod to the left. You are viewing the rod from the top. Your answer should be in the form of a diagram showing the net force vector. (SO)(20)



B7. Will is standing in a bucket that is attached to a long rope that runs up over a pulley and is then attached to a crate of bricks with a mass of 150. kg. When released Will accelerates upwards at 2.58 m/s^2 . When Will is 4.00 m up in the air the crate hits the ground and half the bricks fall out. With what velocity does Will hit the ground on the return trip? (30)