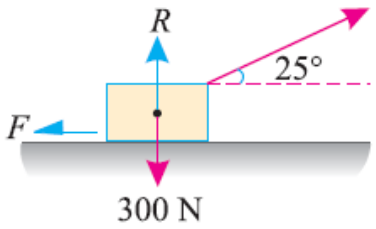
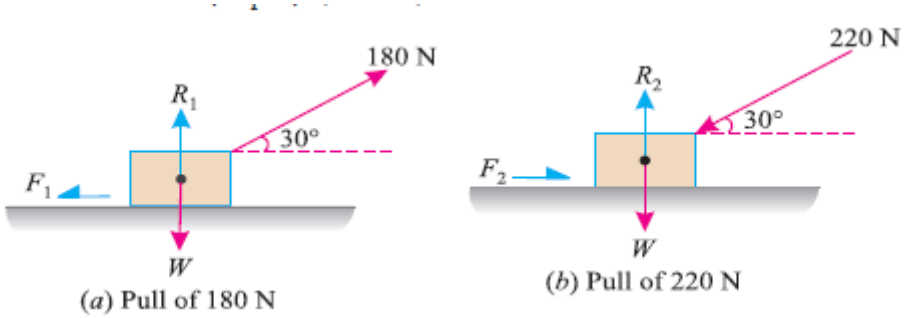
Tutorial sheet 2

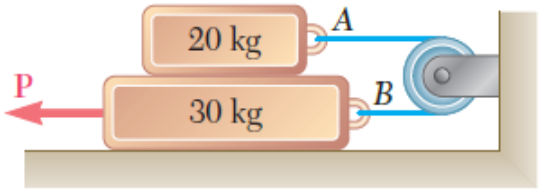
1. A body of weight 300 N is lying on a rough horizontal plane having coefficient of friction 0.3. Find the magnitude of the force which can move the body, while acting at an angle of 25° with the horizontal. **(P=87.1 N)**



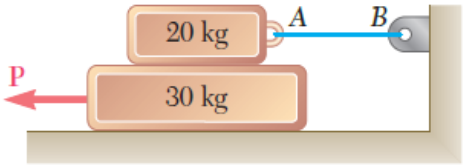
2. A body resting on a rough horizontal plane required a pull of 180 N inclined at 30° to the plane just to move it. It was found that a push of 220 N inclined at 30° to the plane just moved the body. Determine the weight of the body and the coefficient of the friction. **(W=991.2 N and coefficient of friction=0.173)**



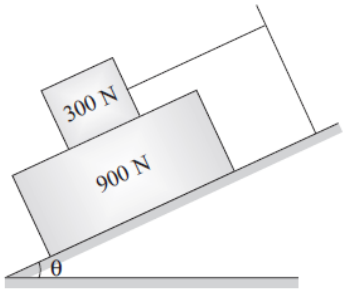
3. The Coefficients of friction are μ_S=0.4 and μ_K=0.3 between all the surfaces of contact. Determine the smallest force P required to start the 30 kg block moving if the cable AB (a) is attached as shown (b) is removed. (**P=353.2 N and P=196.2 N)**



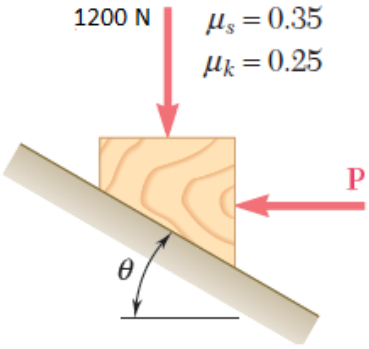
4. The Coefficients of friction are μ_S=0.4 and μ_K=0.3 between all the surfaces of contact. Determine the smallest force P required to start the 30 kg block moving if the cable AB (a) is attached as shown (b) is removed **(P=275 N and P=196.2 N)**



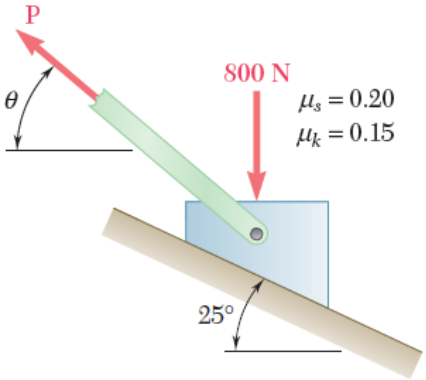
5. What should be the value of θ which will make the motion of 900 N block down the block to impend? The coefficient of friction for all contact surfaces is 1/3. **(θ=29.1°)**



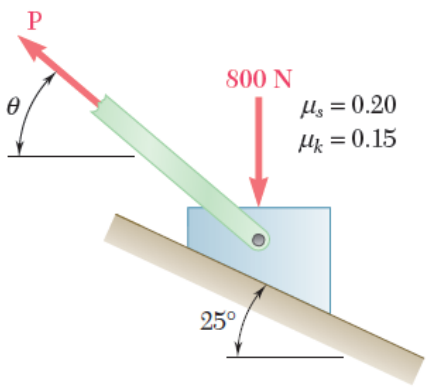
6. Determine whether the block shown is in equilibrium and find the magnitude and direction of the friction force when θ=25and P=750N. **(in equilibrium & F=172.6 N)**



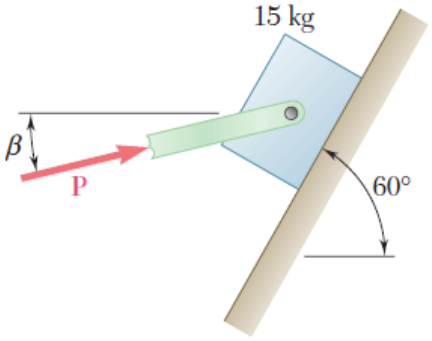
7. Determine whether the block shown is in equilibrium and find the magnitude and direction of the friction force when θ= 40 and P=400 N **(in equilibrium & F=48.3 N)**



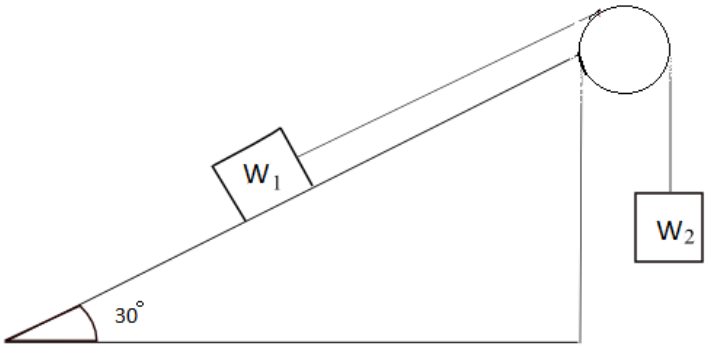
8. Knowing that θ=45, determine the range of values of *P* for which equilibrium is maintained **(222N≤P≤479N)**



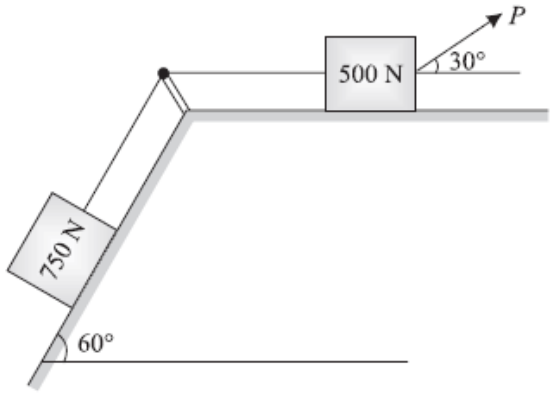
9. Knowing that the coefficient of friction between the 15-kg block and the incline is μs = 0.25, determine (a) the smallest value of P required to maintain the block in equilibrium, (b) the corresponding value of β. **(P=108.8 N, β=46°)**



10. A block of weight W_1=100N rests on an inclined plane and another weight W_2 is attached to the first weight through a string as shown in fig below. If the coefficient of friction between the block and plane is 0.3, determine the maximum and minimum values of W_2 so that equilibrium can exist **(24≤W≤76)**



11. What is the value of P in the system shown in figure to cause the motion to impend? Assume the pulley is smooth and coefficient of friction between the other contact surfaces is 0.2. **(P=853.5 N)**



12. Determine whether the 9 Kg block shown is in equilibrium, find the magnitude and direction of the friction force when P=60 N and θ = 15°? **(Not in equilibrium and F=16.86 N)**