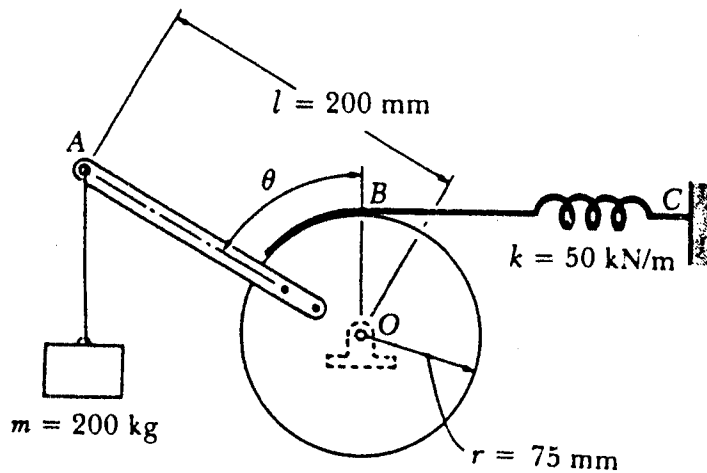
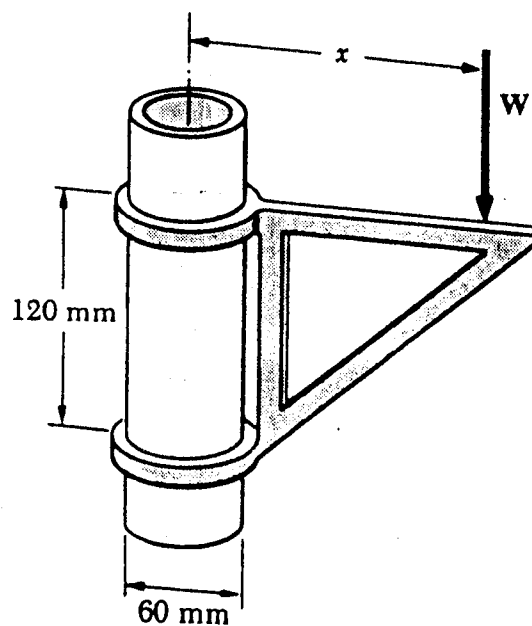


1. (40%) Describe or define the following terminologies.
- Newton's second law of motion
 - Moment of inertia of a mass with respect to an axis
 - Principle of virtual work for a system of rigid bodies
 - Mechanical efficiency
 - Statically determinate structures
 - Stable equilibrium
 - Angular momentum of a rigid body
 - Conservation of energy for a system of particles

2. (15%) A 200-kg block is attached to the lever AO as shown. The constant of the spring BC is $k = 50 \text{ kN/m}$, and the spring is unstretched when $\theta = 0$. Determine the position of equilibrium.

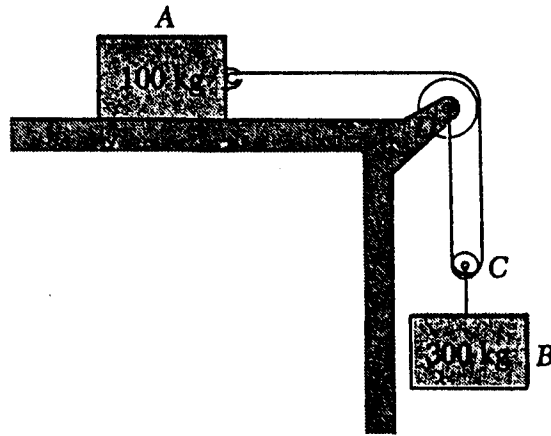


3. (15%) The movable bracket shown may be placed at any height on the 60-mm-diameter pipe. If the coefficient of static friction between the pipe and bracket is 0.25, determine the minimum distance x at which the load W can be supported. Neglect the weight of the bracket.



(背面仍有題目, 請繼續作答)

4. (15%) The two blocks shown start from rest. The horizontal plane and the pulley are frictionless, and the pulley is assumed to be of negligible mass. Determine the acceleration of each block and the tension in each cord.



5. (15%) A 50-kg pulley having a radius of gyration of 0.4 m is connected to two cylinders as shown. Assuming no axle friction, determine the angular acceleration of the pulley and the acceleration of each cylinder.

