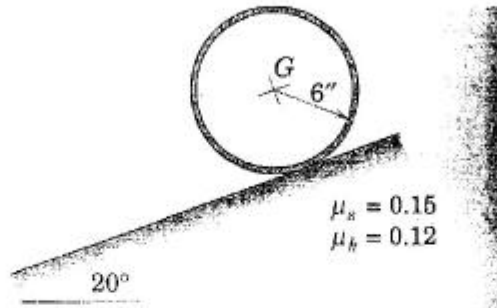1. A metal hoop with a radius $r = 6$ *in* is released from rest on the 20° incline. If the coefficient of static and kinetic friction are $\mu_s = 0.15$ and $\mu_k = 0.12$, determine (a) whether the hoop slips, (b) the angular acceleration of the hoop and (c) the time for the hoop to move a distance of 10 ft down the incline.

$\mu_s = 0.15$
$\mu_k = 0.12$

20°

2. The 4-ft slender bar weighs 40 lb with mass center at B and is released from rest in the position for which θ is essentially zero. Point B is confined to move in the smooth vertical guide, while end A moves in the horizontal guide and compresses the spring as the bar falls. Determine (a) the angular velocity of the bar as the position $\theta = 30°$ is passed and (b) the velocity with which B strikes the horizontal surface if the stiffness of the spring is 30 lb/in.
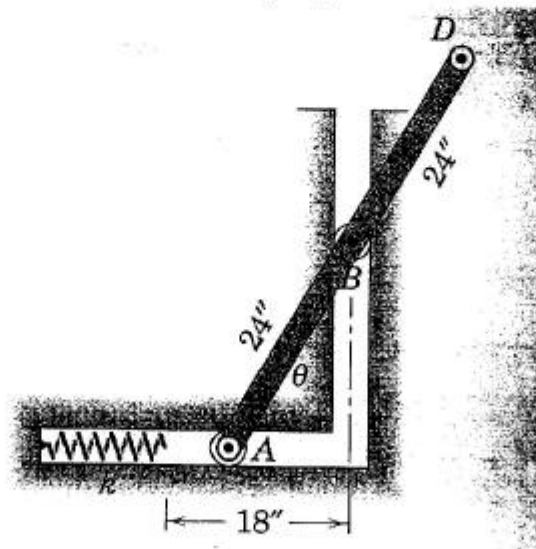
1. For the system and loading shown neglecting the weight, determine (a) the force P required for equilibrium, (b) the corresponding force in member BD, (c) the reaction at C.   (25 %)
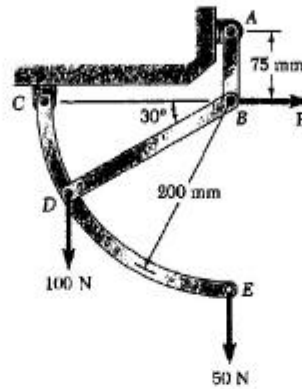
2. Determine the range of values of force P for which equilibrium of the block is maintained.   (25 %)