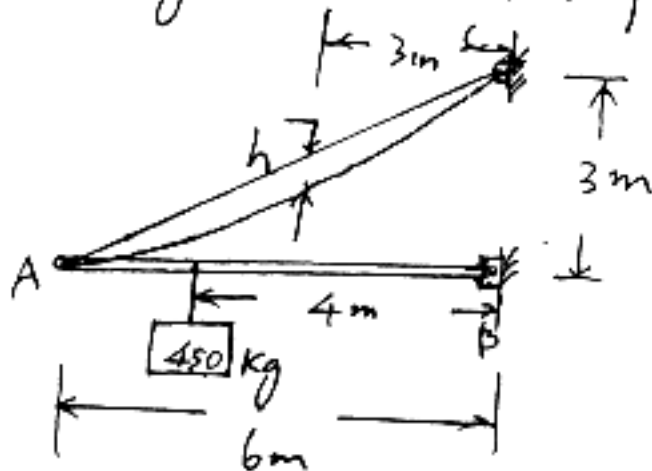


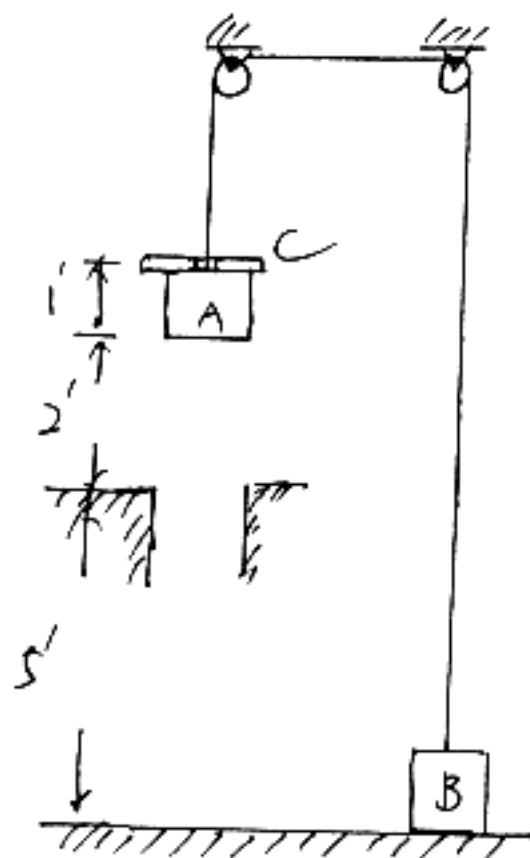
1. The total mass of cable AC is 25 kg. Assuming that the mass of the cable is distributed uniformly along the horizontal, determine the sag  $h$  and the slope of the cable A and C. (25%)



2. The moments and product of inertial of an L 127x76x12.7 mm angle cross section with respect to two rectangular axes  $x$  and  $y$  through  $C$  (centroidal axes) are, respectively  $\bar{I}_x = 3.93 \times 10^6 \text{ mm}^4$ ,  $\bar{I}_y = 1.074 \times 10^6 \text{ mm}^4$ , and  $\bar{I}_{xy} < 0$ , with the minimum value of the moment of inertia of the area with respect to any axis through  $C$  being  $\bar{I}_{\min} = 0.615 \times 10^6 \text{ mm}^4$ . Using Mohr's circle, Determine (a) the product of inertia  $\bar{I}_{xy}$  of the area, (b) the orientation of the principal axes, (c) the value of  $\bar{I}_{\max}$ . (25%)

3. Two blocks A and B, weighing 9 lb and 10 lb, respectively, are connected by a cord which passes over pulleys as shown. A collar C is placed on block A and the system is released from rest. After the blocks have moved 3 ft, collar C is removed and the blocks continue to move, knowing that collar C weighs 5 lb, determine the speed of block A just before it strikes the ground. (25%)

(背面仍有題目,請繼續作答)



4. At the instant shown, the ladder has an angular acceleration of  $\frac{1}{4} \text{ rad/sec}^2$  clockwise and end A is moving to the left at  $8 \text{ ft/sec}$ . Determine the acceleration of end A; end B remains in contact with the wall (25%)

