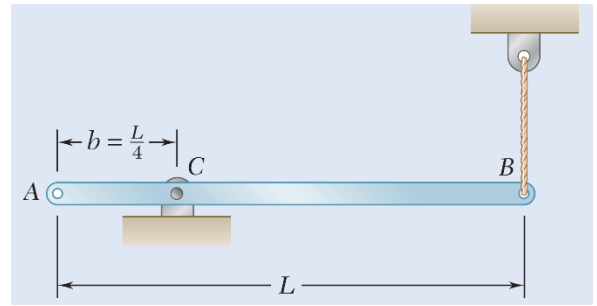


## Tutorial Set 7 (Part A)

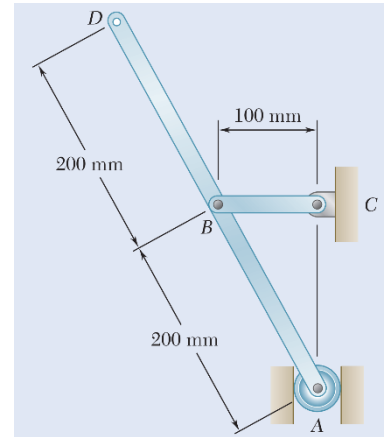
- 1) A uniform rod of length  $L$  and mass  $m$  is supported as shown.

If the cable attached at end  $B$  suddenly breaks, determine

- (a) the acceleration of end  $B$ ,  
(b) the reaction at the pin support.

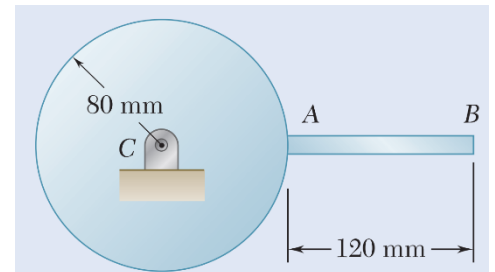


- 2) The 4-kg uniform rod ABD is attached to the crank BC and is fitted with a small wheel that can roll without friction along a vertical slot. Knowing that at the instant shown crank BC rotates with an angular velocity of 6 rad/s clockwise and an angular acceleration of 15 rad/s<sup>2</sup> counterclockwise, determine the reaction at A and B.



## Set 7 (Part B)

- 1) A 1.5-kg slender rod is welded to a 5-kg uniform disk as shown. The assembly swings freely about C in a vertical plane. Knowing that in the position shown the assembly has an angular velocity of 10 rad/s clockwise, determine
- (a) the angular acceleration of the assembly,  
(b) the components of the reaction at C.



[Ans:  $\alpha = 43.6 \text{ rad/s}^2$  ↺     $C_x = 21.0 \text{ N}$  ←     $C_y = 54.6 \text{ N}$  ↑ ]

- 2) Two 4 kg uniform bars are connected to form the linkage shown. Neglecting the effect of friction, determine the reaction at D immediately after the linkage is released from rest in the position shown.

[Ans:  $D = 1.619 \text{ N}$  ← ]

