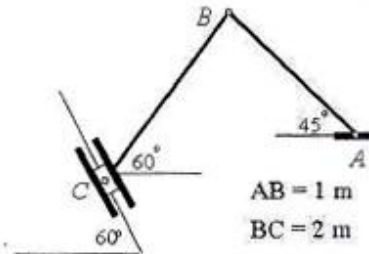


**Question 1:**

A disk having a radius of 50 Cm rotates with an initial angular velocity of 2 rad/s and has a constant angular deceleration of 1 rad/s<sup>2</sup>. Determine the magnitudes of the velocity and acceleration of a point on the rim of the disk when t=2 s.

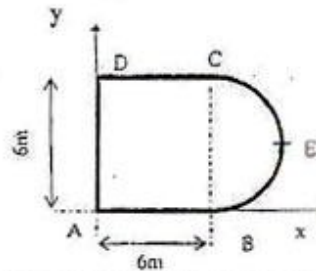
**Question 2:**

In the shown mechanism rod AB (L=1m) rotates with angular velocity  $\omega_{AB}=120$  r.p.m (C.W) and with angular acceleration 2 rad/s<sup>2</sup> (C.C.W). For the shown instant determine  $\underline{V}_B$ ,  $\underline{V}_C$  and  $\underline{a}_B$



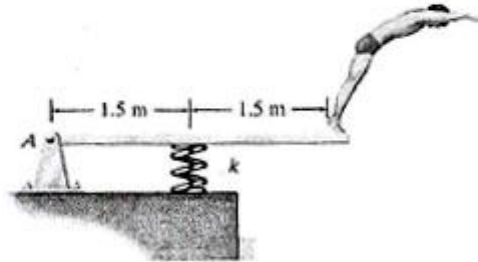
**Question 3:**

The shown metal frame ABECDA composed of 3 uniform rods AB, AD, CD and semicircular rod BEC all with the same cross section ( $\rho=4$  kg/m). Find the center of mass,  $I_A$  and  $k_A$  for the frame.



**Question 4:**

Determine the angular acceleration of the 25 kg diving board and the horizontal and vertical components of reaction at the pin A the instant the man jumps off. Assume that the board is uniform and rigid, and that at the instant he jumps off the spring is compressed a maximum amount of 200 mm, and the board is horizontal. Take  $k = 7 \text{ kN/m}$ .



**Question 5:**

The shown uniform rod AB ( $m=10 \text{ kg}$ ) is connected to spring ( $k=1000 \text{ N/m}$ ,  $L_0=0.15 \text{ m}$ ). The rod is released from rest from the shown position, and passes the vertical position. Determine  $\omega_2$ .

