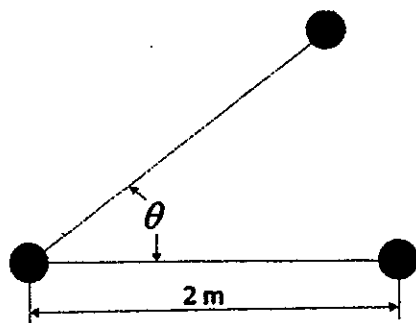
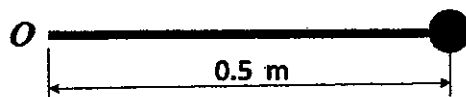


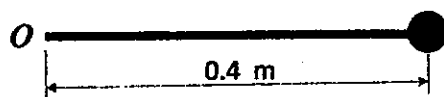
1. (20%) The 2-kg pendulum bob moves in the horizontal plane with a velocity of 6 m/s when $\theta = 0^\circ$. Determine the angle θ when the tension in the cord becomes zero.



2. (20%) A 2-kg disk rests on a smooth horizontal plane and is attached to an elastic cord that has a stiffness of $k_c = 20 \text{ N/m}$ and the unstretched cord length is 0.5 m. Initially unstretched; if the disk is given a velocity $v = 1.5 \text{ m/s}$ perpendicular to the cord, please use the conservation of angular momentum and conservation of energy to find the speed of the disk at the instant the cord is stretched 0.2 m. O is the center of rotation.

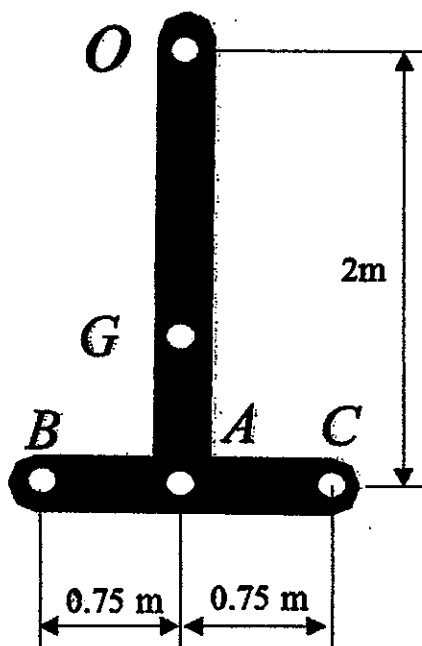


3. (20%) The disk is initially at rest in a horizontal plane and is given an angular acceleration $\alpha = 5t^{\frac{1}{2}} \text{ rad/s}^2$, where t represents time in seconds. Determine the magnitudes of the normal and tangential acceleration of point P . O is the center of rotation.

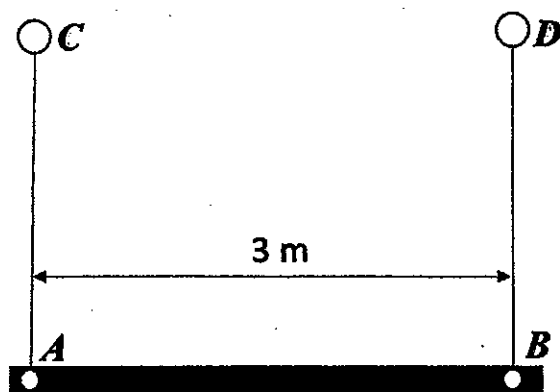


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4. (20%) The pendulum is suspended from the pin at O and consists of two thin rods. Rod OA has a mass of 12-kg, and rod BC has a mass of 9-kg. Determine the moment of inertia of the pendulum about an axis passing through the mass center G of the pendulum.



5. (20%) The uniform 50-kg bar is held in the equilibrium position by cord AC and BD . Determine the tension in BD and the angular acceleration of the bar immediately after AC is cut.



試題隨卷繳回