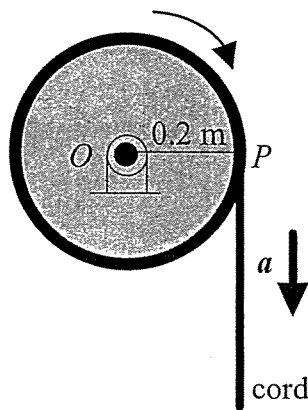


1. 25%

A cord wrapped around a wheel is initially at rest as shown in the following figure. If a force is applied to the cord, and gives it an acceleration  $a=4t$  m/s<sup>2</sup>, where  $t$  is time in seconds, determine as a function of time the angular velocity of the wheel in rad/s.



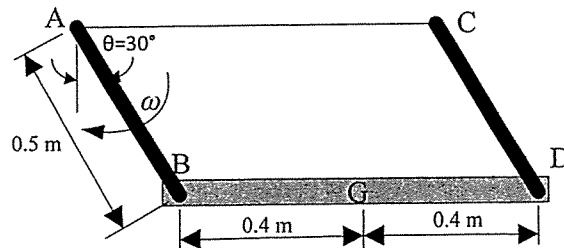
2. 25%

A race car travels around a horizontal circular track that has a radius of 300 m. If the car increases its speed at a constant rate of  $7$  m/s<sup>2</sup>, starting from rest. Determine the time needed for the car to reach an acceleration of  $8$  m/s<sup>2</sup>.

見背面

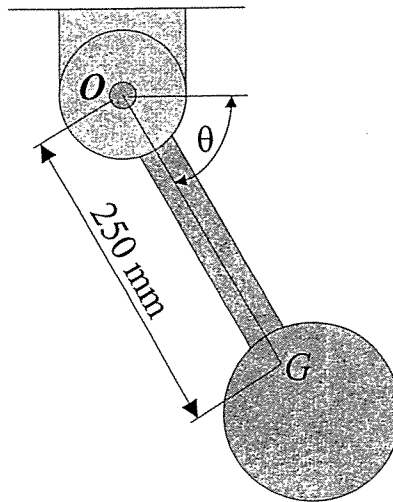
3. 25%

The 10 kg beam BD shown in the following figure is supported by two rods of negligible mass, A, B, C, D are rotational pin joints of no friction. Determine the force created in each rod if at the instant  $\theta=30^\circ$  the rods are both swing freely with an angular velocity of  $\omega=6$  rad/s.



4. 25%

The pendulum has a mass of 7.5 Kg with center of mass at G and has a radius of gyration about the pivot O of 295 mm. If the pendulum is released from rest at  $\theta = 0$ , determine the total force supported by the bearing at the instant when  $\theta = 60^\circ$ . There is no friction in the bearing.



試題隨卷繳回