1. Please answer the following questions in English.

   (1) (13%) What are conservative forces?

   (2) (12%) Particle B moves in a circular motion **with constant speed**. Denote $\vec{a}_{A/B}$ the relative acceleration of the particle A observed from B. Can we write $\vec{F} = m\vec{a}_{A/B}$ by Newton's second law for calculating the total applied force on A? Explain your answer.

2. (25%) Link OA has a constant clockwise angular velocity of 3 rad/sec for a brief interval of its rotation. Determine the angular acceleration α_{BC} of BC for the instant when $\theta = 60°$. First use a rotating-frame analysis, and then verify your result with an absolute-motion approach.
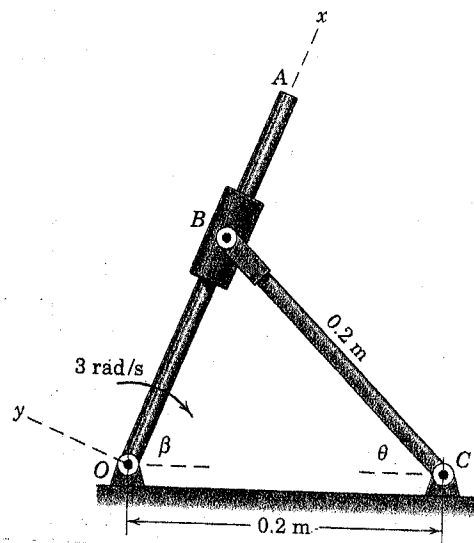
3. (25%) The thin homogeneous panel of mass m is hinged to swing freely about a fixed axis which makes an angle α with the vertical. Determine the period of small oscillations.
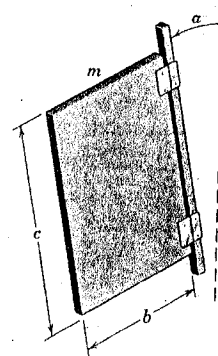
4. The 30-kg wheel shown in the figure has a mass center at G and a radius of gyration $k_G = 150$ m. If the wheel is originally at rest and released from the position shown,
   (1) (10%) first draw the free-body and kinetic diagrams completely,
   (2) (15%) and then determine its angular acceleration and the friction force of the wheel on the ground. Assume that *slipping does not occur*.