Homework H3.D

Given: A semi-circular slot is cut into arm OB. Arm OB is pinned to ground at end O. Pin P is constrained to move within the slot in arm OB, with P connected to ground through rigid link AP. Arm OB is rotating in the counter-clockwise sense with a constant rotation rate of ω_{OB}. At the position shown, P is directly to the left of the center of the semi-circular slot C.

Find: For this position,

(a) Determine the angular velocity of link AP and the speed of P relative to arm OB.

(b) Determine the angular acceleration of link AP and the rate of change of speed of P relative to arm OB.

Leave your answers in terms of, at most, R and ω_{OB}.

HINT: Use an observer attached to the slotted arm OB, and relate the kinematics of points O and P through the moving reference frame kinematics equations.