

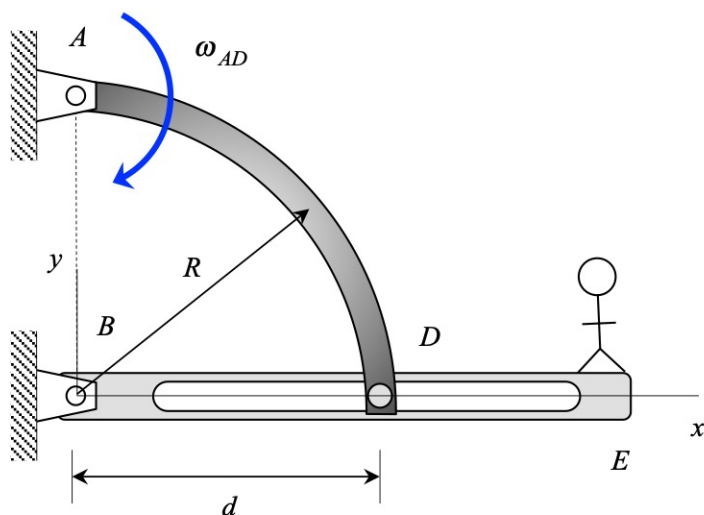
Homework H.3.C

Given: Arm AD is made from a quarter circular arc bar of radius R and is pinned to fixed ground at end A. Slotted arm BE is pinned to fixed ground at end B with pin B located directly below pin A, as shown. A pin at end D of the curved arm is allowed to slide within the slot of arm BE. At the position shown, arm BE is horizontal, and arm AD is rotating CW with a constant rate of ω_{AD} .

Find: For this position,

- Determine the angular velocity of arm BE and the value of \dot{d} .
- Determine the angular acceleration of arm BE and the value of \ddot{d} .

HINT: Use an observer attached to the slotted arm BE, and relate the kinematics of points B and D through the moving reference frame kinematics equations.



Homework H.3.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,

- Determine the angular velocity of link AP and the speed of P relative to arm OB.
- 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.

