Homework 3.G

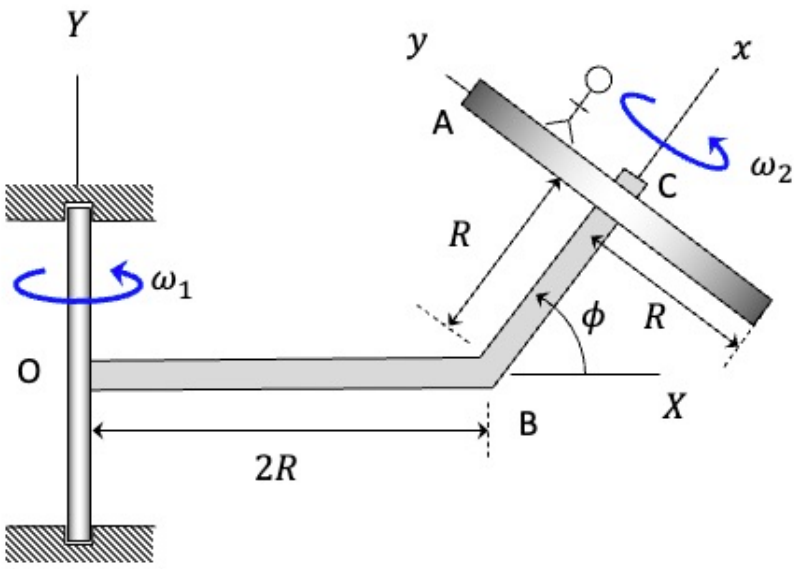
Given: The angled arm OBC is rigidly attached to a vertical shaft, with the shaft rotating with a constant rate of ω_1 about a fixed axis. The angle between sections OB and BC of the arm has a fixed value of ϕ. A disk, having a radius of R, rotates about section BC at end C of the arm with an angular speed of ω_2 relative to the arm. An observer and a set of xyz-axes are attached to the disk, and the XYZ-axes are stationary.

Find: Using the 3D moving reference frame kinematics equations:

(a) Determine the angular velocity of the disk. Write this answer as a vector.

(b) Determine the angular acceleration of the disk. Write this answer as a vector.

(c) Determine the acceleration of point A on the perimeter of the disk. Write this answer as a vector.



Your answers should be in terms of, at most: ω_1, ω_2, ϕ and R.