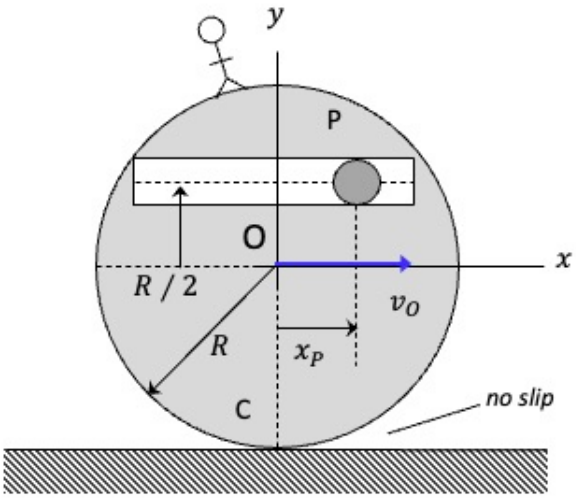
Homework 3.A

Given: A disk having a radius of R rolls without slipping to the right with its center O having a constant speed of v_O. An observer and a set of xyz-axes are attached to the disk, with x being aligned with a straight slot that is cut into the disk. A particle P moves within the slot. The position of P within the slot is given by the coordinate x_P, where $\dot{x}_P$ = constant.

Find: At the instant shown, the slot is parallel to the surface on which the disk rolls. For this position, determine the velocity and acceleration of P. Write your answers in terms of their xy-components.



Your answers should be in terms of, at most: v_O, x_P, $\dot{x}_P$ and R.