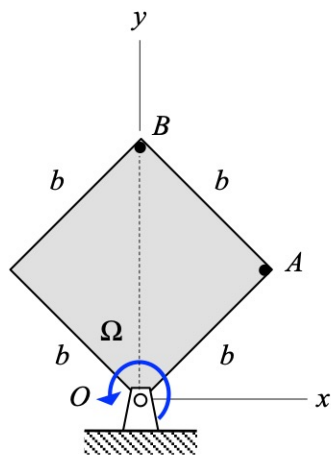
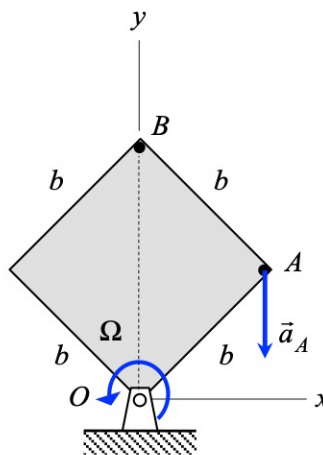


Homework H.2.A

Given: A square plate (having side lengths of $b = \sqrt{2}$ m) rotates with a counterclockwise sense at a rate of $\Omega = 5$ rad/s about a shaft passing through corner O. At the position shown below, corner B is directly above the shaft O.

Find: Consider the following two parts of this problem:

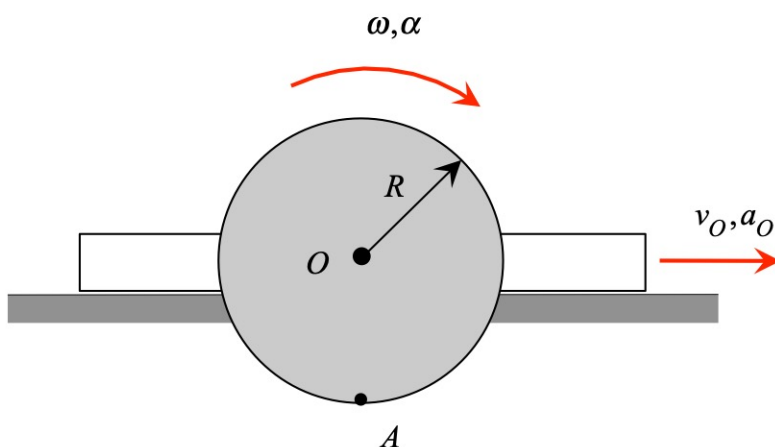
- (a) For the first part, we are given that the rotation rate of the plate is changing at a rate of $\dot{\Omega} = 10$ rad/s². Determine the velocity and acceleration vectors for corners A and B of the plate. Make sketches of these vectors.
- (b) For the second part, we are not given information on $\dot{\Omega}$. Instead, we know the acceleration of corner A to be in the negative y-direction (the x-component is zero), as shown in the figure below. For this, determine the numerical value of $\dot{\Omega}$ and of the acceleration vector for corner B. Make a sketch of the acceleration vector for corner B.

**Part (a)****Part (b)**

Homework H.2.B

Given: A circular disk is pinned to a block at its center O , with the block being constrained to move along a horizontal surface. The angular velocity $\vec{\omega}$ and angular acceleration $\vec{\alpha}$ of the disk are in the directions shown in the figure. The block is moving the right with a speed of v_O and an acceleration of a_O . At the position shown, point A on the perimeter of the disk is directly below O .

Find: For this position, determine the velocity and acceleration of point A . Express your answers as vectors.



Use the following parameters in your analysis: $R = 0.75$ m, $\omega = 4$ rad/s, $\alpha = 2$ rad/s², $v_O = 3$ m/s and $a_O = 4$ m/s².