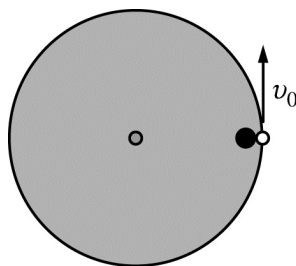


**2014 AP<sup>®</sup> PHYSICS C: MECHANICS FREE-RESPONSE QUESTIONS**

Top View

The person now stands on a similar disk of mass  $m$  and radius  $R$  that has a fixed pole through its center so that it can only rotate on the ice. The person throws the same stone horizontally in a tangential direction at initial speed  $v_0$ , as shown in the figure above. The rotational inertia of the disk is  $mR^2/2$ .

- (d) Derive an expression for the angular speed  $\omega$  of the disk immediately after the stone is thrown.
- (e) The person now stands on the disk at rest  $R/2$  from the center of the disk. The person now throws the stone horizontally with a speed  $v_0$  in the same direction as in part (d). Is the angular speed of the disk immediately after throwing the stone from this new position greater than, less than, or equal to the angular speed found in part (d) ?

\_\_\_\_ Greater than      \_\_\_\_ Less than      \_\_\_\_ Equal to

Justify your answer.

**STOP**

**END OF EXAM**