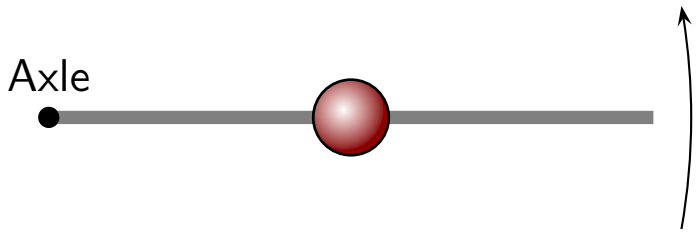
Question 1

A point-like ball can slide along a rod, whose mass is negligible. The rod can rotate in a horizontal plane, with the ball supported on a frictionless surface, about an axle at one end. When the ball is halfway along the rod, the angular velocity of the rod is ω_i.



Which of the following is true about the angular velocity, ω_f, when the ball reaches the end of the rod?

1. $\omega_f = \frac{1}{4}\,\omega_i$
2. $\omega_f = \frac{1}{2}\,\omega_i$
3. $\omega_f = \omega_i$
4. $\omega_f = 2\omega_i$
5. $\omega_f = 4\omega_i$