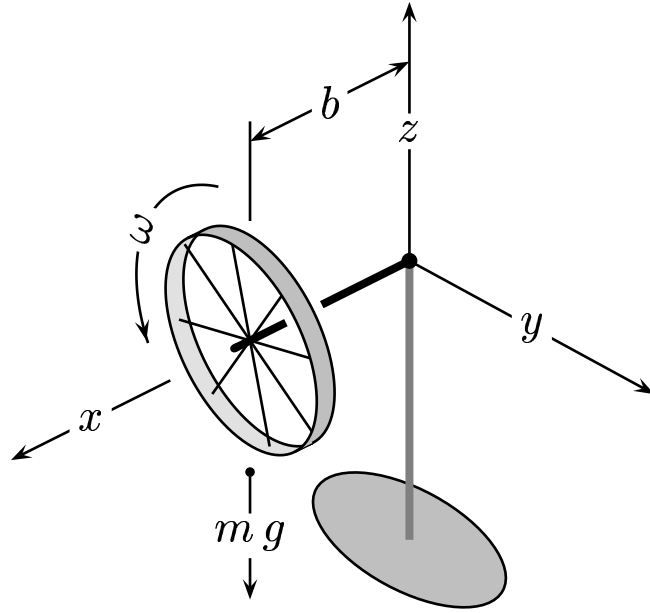


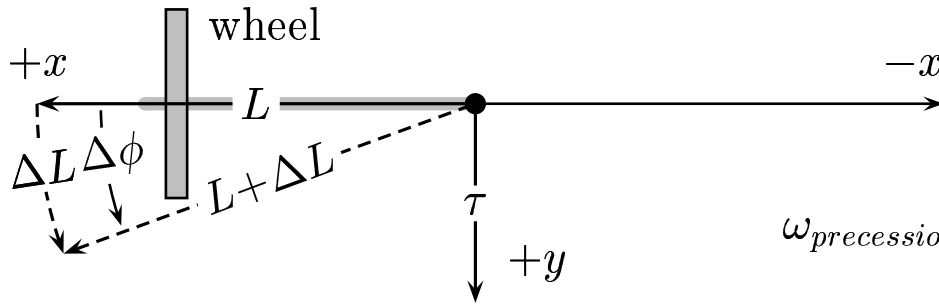
Given: This set up is a rotating bike wheel. At the moment, the angular momentum is pointing along x -axis. The wheel's axel is pivoted a distance b from the wheel's center of rotation.



Determine the direction of precession about the z -axes as viewed from the top.

- A) clockwise.
- B) counterclockwise.
- C) There is no precession since angular momentum is conserved.

Viewed from Above



$$\omega_{precession} = \frac{\Delta\phi}{\Delta t} = \frac{\Delta L}{L \Delta t} = \frac{m g b}{I \omega}.$$

The torque “ $\tau = b \times m g$ ” due to the weight of the wheel is along the positive y -direction. This implies that the change in \vec{L} ($\Delta L = \tau \Delta t$, since $\tau \equiv \frac{dL}{dt}$) is along the positive y -direction.

As viewed from the top, the increment ΔL is down, which leads to a counterclockwise motion.

Answer **B**.

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