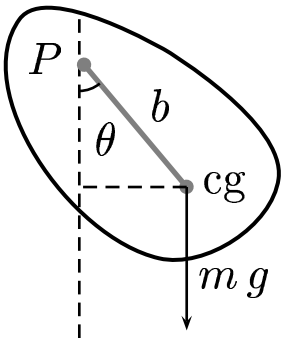

Consider the setup of a physical pendulum where P is the pivot point. b is the distance between P and the center of gravity. By applying $\tau = I\,\alpha$, in small θ approximation, where $b_\perp = b\,\sin\theta \simeq b\,\theta$, the equation of motion is given by

$$\tau = I\,\alpha = I\,\frac{d^2\,\theta}{dt^2} = -m\,g\,b\sin\theta \simeq -(m\,g\,b)\,\theta\,.$$

Determine the period T, of the physical pendulum.

A) $T = \sqrt{\dfrac{I}{m\,g\,b}}$

B) $T = 2\,\pi\,\sqrt{\dfrac{I}{m\,g\,b}}$

C) $T = \sqrt{\dfrac{m\,g\,b}{I}}$

D) $T = 2\,\pi\,\sqrt{\dfrac{m\,g\,b}{I}}$

Present equation of motion of $\tau = I\,\alpha$ implies, $\omega^2 = \dfrac{b\,m\,g}{I}$, in turn $2\,\pi\,\sqrt{\dfrac{I}{m\,g\,b}}$.

Answer **B**.