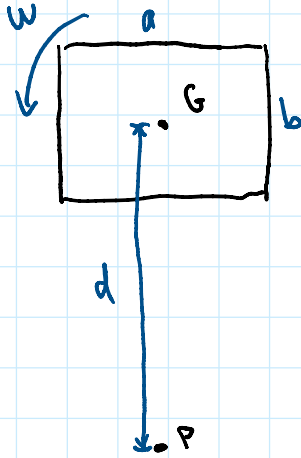


20-R-WE-DK-6 Beginner kinetic Energy

Inspiration: None



If a rectangular plate has dimensions $a = 4 \text{ m}$, $b = 3 \text{ m}$ what is the difference in kinetic energy if it is rotating about its center of gravity G , comparatively to rotating about the point P which is a distance $d = 6.5 \text{ m}$ away. In both cases, the plate has an angular velocity of $\omega = 3 \text{ rad/s}$ and has a mass $m = 14 \text{ kg}$.

$$I_G = \frac{1}{12} m(a^2 + b^2) = \frac{1}{12} (14)(4^2 + 3^2) = \frac{175}{6}$$

$$T_G = \frac{1}{2} I_G \omega^2 = \frac{1}{2} \left(\frac{175}{6} \right) (3^2) = 131.25$$

$$I_P = \frac{1}{12} m(a^2 + b^2) + md^2 = \frac{1}{12} (14)(4^2 + 3^2) + 14(6.5)^2 = \frac{1862}{3}$$

$$T_P = \frac{1}{2} \left(\frac{1862}{3} \right) (3^2) = 2793$$

$$\Delta T = 2661.75$$