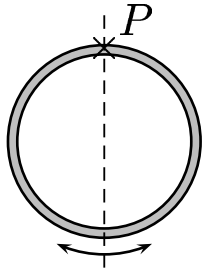


The period of a physical pendulum is  $T = 2\pi \sqrt{\frac{I}{mgb}}$ , where  $m$  is the mass  $I$  the moment of inertia about the pivot point and  $b$  the distance between the pivot point and the center of gravity. Consider the setup where the pivot point P is at the top (see sketch).



Determine the  $I$  and  $b$  for a loop with a radius  $r$  and mass  $m$ .

- A)  $b = r$  and  $I = m r^2$ .
- B)  $b = r$  and  $I = 2 m r^2$ .
- C)  $b = 2 r$  and  $I = m r^2$ .
- D)  $b = 2 r$  and  $I = 2 m r^2$ .

$b$  is the distance between P and the center, so  $b = r$ .

$$I = I_{cm} + M D^2 = m r^2 + m r^2 = 2 m r^2.$$

Answer **B**.