



A circular disk is suspended by a wire attached to the top of some fixed support. When the disk is twisted through some small angle  $\theta$ , the twisted wire exerts a restoring torque on the body which satisfies  $\tau = I \alpha = I \frac{d^2\theta}{dt^2} = -\kappa \theta$ , where  $\kappa$  is referred to as the torsion constant of the wire.

Find the period of the oscillation.

- A)  $T = \sqrt{\frac{I}{\kappa}}$ .
- B)  $T = 2\pi \sqrt{\frac{I}{\kappa}}$ .
- C)  $T = \sqrt{\frac{\kappa}{I}}$ .
- D)  $T = 2\pi \sqrt{\frac{\kappa}{I}}$ .

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Present equation of motion implies that,  $\omega = \frac{\kappa}{I}$ , in turn:  $T = 2\pi \sqrt{\frac{I}{\kappa}}$ .

Answer **B** .