Period of a Physical Pendulum

Physical Pendulum

- Recall, $T = 2\pi\sqrt{\frac{L}{g}}$ for a simple pendulum.
- Consider a meter stick oscillating from one end – NOT simple.

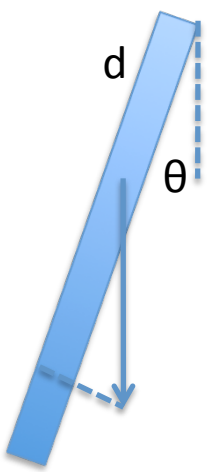
$$F = -kx \qquad \tau = -k\theta$$

$$\tau = -mg\sin\theta d$$

$$\tau = -mgd\theta$$

If θ is small then sinθ ≈ θ

$$k = mgd$$



$$\omega = \sqrt{\frac{k}{m}} \qquad \omega = \sqrt{\frac{k}{I}} = \sqrt{\frac{mgd}{I}}$$

$$T = \frac{2\pi}{\omega}$$

$$T = 2\pi\sqrt{\frac{I}{mgd}}$$

Check:
For point mass @ end