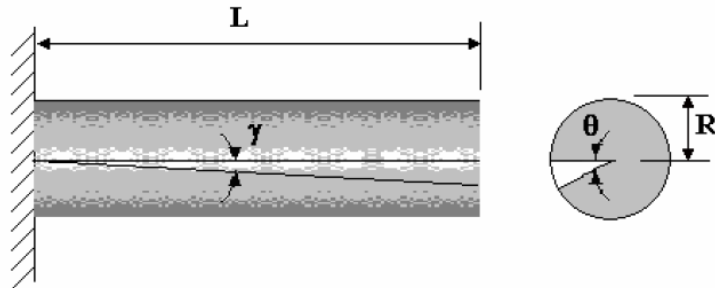


Answer on Question #41161, Physics, Mechanics | Kinematics | Dynamics

A long wire hangs vertically with its upper end clamped. A torque of 6 Nm is applied to free end twist it through 60 degree. The potential energy of twisted wire is??

Answer in terms of pi.

Solution:



The elastic potential energy in a wire twisted by a torque T at an angle θ is

$$U = \frac{T\theta}{2}$$
$$\theta = 60^\circ = \frac{\pi}{3}$$

Thus,

$$U = \frac{6 \cdot \pi}{2 \cdot 3} = \pi \text{ J}$$

Answer. π .