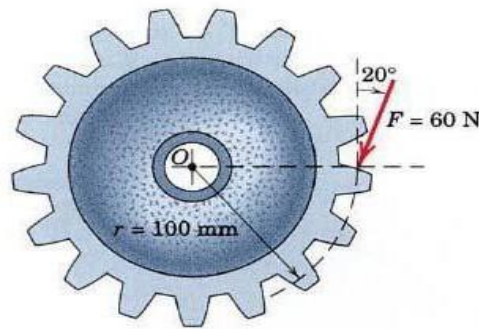




Moment of a Force

Example 1

A force F of magnitude 60 N is applied to the gear. Determine the moment of F about point O .

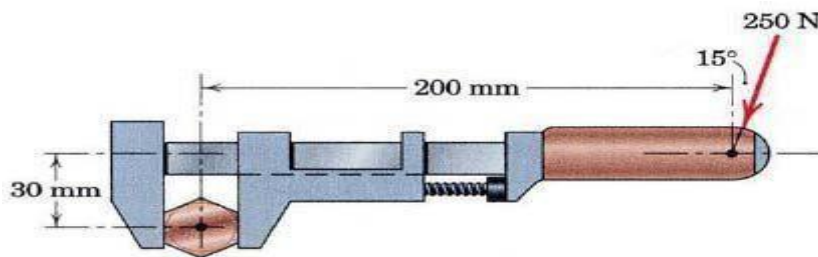


$$\begin{aligned} M_o &= Fd \\ &= 60 \cos 20^\circ \times \frac{100}{1000} \\ &= 60 \cos 20^\circ \times 0.1 \\ &= 5.64 \text{ N.m} \end{aligned}$$



Example 2

Calculate the moment of the 250 N force on the handle of the monkey wrench about the center of the bolt.



$$M_o = Fd$$

$$= 250 \cos 15^\circ \times \frac{200}{1000} - 250 \sin 15^\circ \times \frac{30}{1000}$$

$$= 250 \cos 15^\circ \times 0.2 - 250 \sin 15^\circ \times 0.03$$

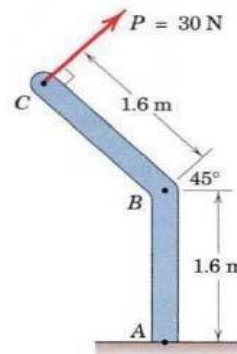
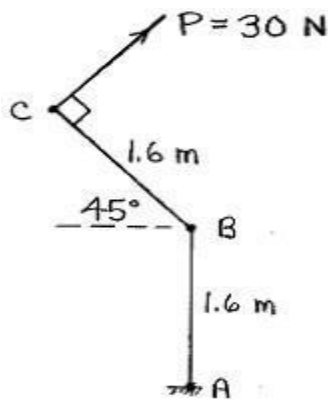
$$= 48.30 - 1.941$$

$$= 46.4 \text{ N.m}$$



Example 3

The 30 N force P is applied perpendicular to the portion BC of the bent bar. Determine the moment of P about point B and about point A



$$M_o = Fd$$

$$\begin{aligned} M_A &= 30 \cos 45^\circ \times (1.6 + 1.6 \sin 45^\circ) + 30 \sin 45^\circ \times 1.6 \cos 45^\circ \\ &= 81.9 \text{ N.m} \end{aligned}$$

$$\begin{aligned} M_B &= 30 \times 1.6 \\ &= 48 \text{ N.m} \end{aligned}$$



Home work

A force of 200 N is applied to the end of the wrench to tighten a flange bolt which holds the wheel to the axle. Determine the moment AI produced by this force about the center O of the wheel for the position of the wrench shown.

