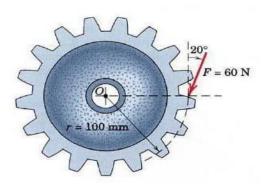


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# Moment of a Force

# Example 1

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



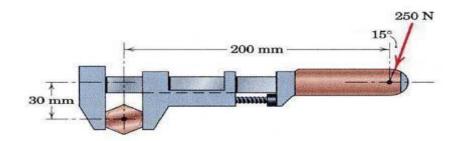
$$M_o = Fd$$
  
=  $60\cos 20^{\circ} \times \frac{100}{1000}$   
=  $60\cos 20^{\circ} \times 0.1$   
=  $5.64 \text{ N.m}$ 

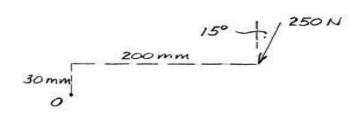


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# Example 2

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





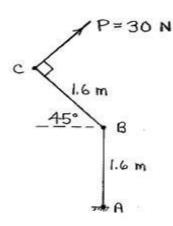
$$\begin{split} M_o &= Fd \\ &= 250 \cos 15^{\circ} \times \frac{200}{1000} - 250 \sin 15^{\circ} \times \frac{30}{1000} \\ &= 250 \cos 15^{\circ} \times 0.2 - 250 \sin 15^{\circ} \times 0.03 \\ &= 48.30 \text{-} 1.941 \\ &= 46.4 \text{ N.m} \end{split}$$

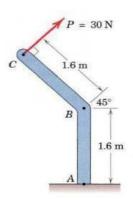


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# Example 3

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





$$M_o = Fd$$

$$M_A = 30\cos 45^\circ \times (1.6+1.6\sin 45^\circ) + 30\sin 45^\circ \times 1.6\cos 45^\circ$$
  
= 81.9 N.m

$$M_B = 30 \times 1.6$$
  
= 48 N.m



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#### 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.

