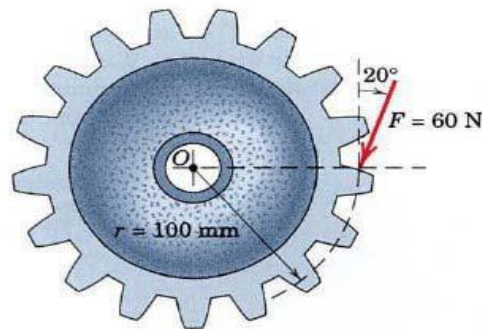Moment of a Force

Example 1

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

$M_o = Fd$
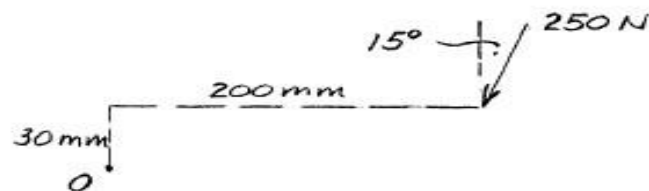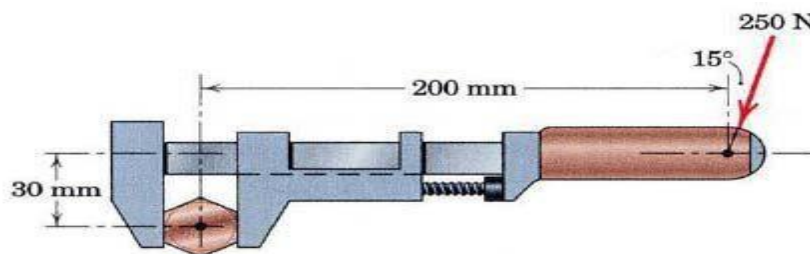
$\quad = 60\cos 20^\circ \times \dfrac{100}{1000}$

$\quad = 60\cos 20^\circ \times 0.1$

$\quad = 5.64 \text{ N.m}$

Example 2

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

$M_o = Fd$

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

$$= 250 \cos 15° \times 0.2 - 250 \sin 15° \times 0.03$$

$$= 48.30 - 1.941$$

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

Al-Mustaqbal University / College of Engineering & Technology
Electrical Techniques Engineering Department Class (1ˢᵗ)
Subject (Engineering Mechanics) / Code (UOMU025021)
Lecturer (Msc Hiba Mohsin AL-Bawi)
1ˢᵗterm – Lecture No.5

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
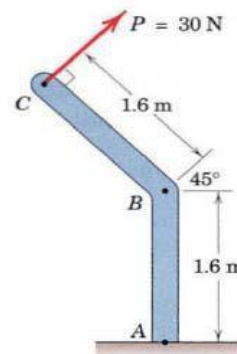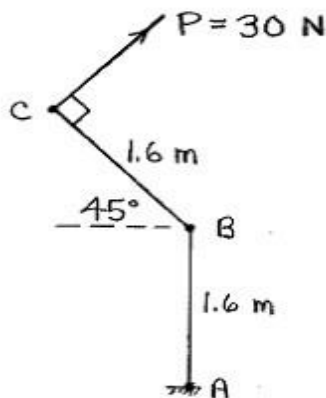
$M_o = Fd$

$M_A = 30\cos 45° \times (1.6+1.6\sin 45°) +30\sin 45°\times 1.6 \cos 45°$

$\quad = 81.9$ N.m

$M_B = 30\times 1.6$

$\quad = 48$ N.m

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.