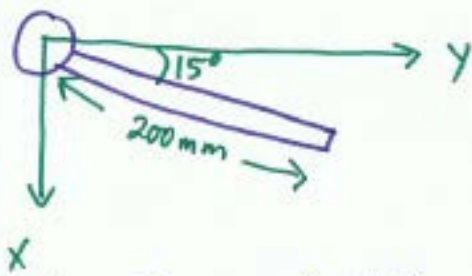
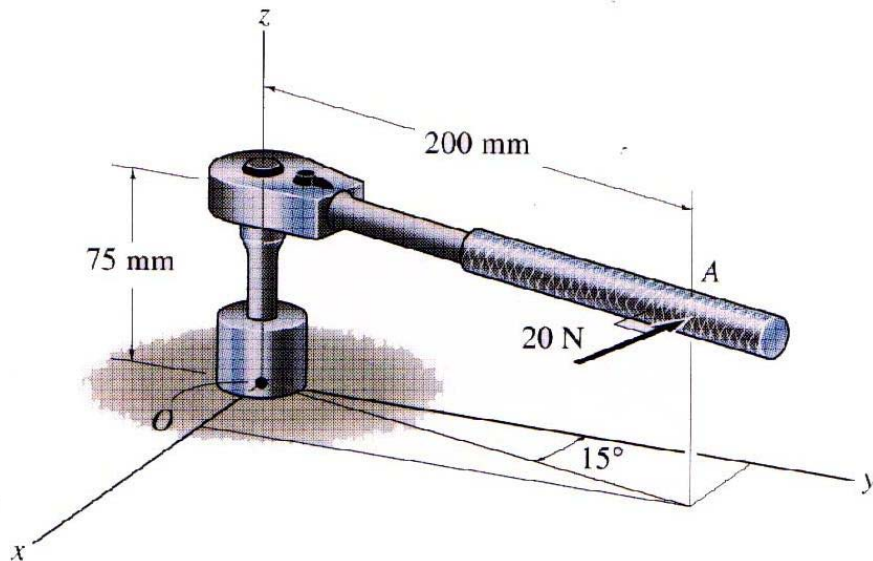


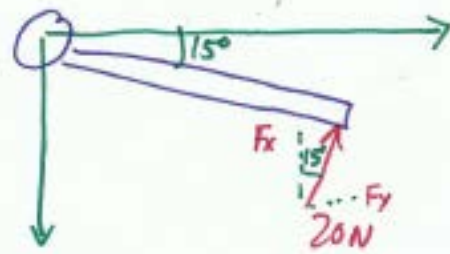
3D Moments 1

A 20 N horizontal force is applied perpendicular to the handle of the socket wrench. Determine the moment created by this force about point O .



$$\begin{aligned}X &= 200 \sin 15^\circ = 51.8 \text{ mm} \\Y &= 200 \cos 15^\circ = 193.2 \text{ mm} \\Z &= 75 \text{ mm}\end{aligned}$$

$$\vec{r}_{OA} = [51.8 \ 193.2 \ 75] \text{ mm}$$



$$\begin{aligned}F_x &= -20 \cos 15^\circ = -19.32 \text{ N} \\F_y &= 20 \sin 15^\circ = 5.18 \text{ N} \\F_z &= 0\end{aligned}$$

$$\vec{F} = [-19.32 \ 5.18 \ 0]$$

$$\vec{M}_O = \vec{r}_{OA} \times \vec{F} = [51.8 \ 193.2 \ 75] \times [-19.32 \ 5.18 \ 0]$$

$$\vec{M}_O = [-388 \ -1449 \ 4000] \text{ Nmm}$$