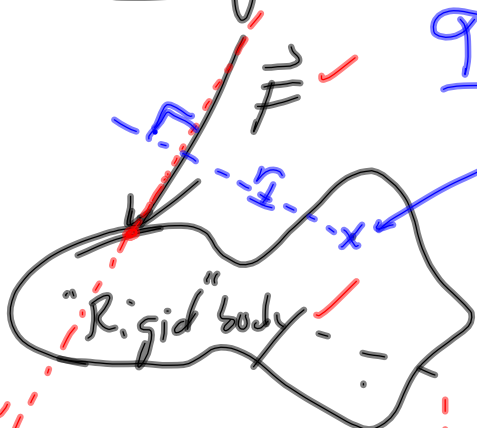
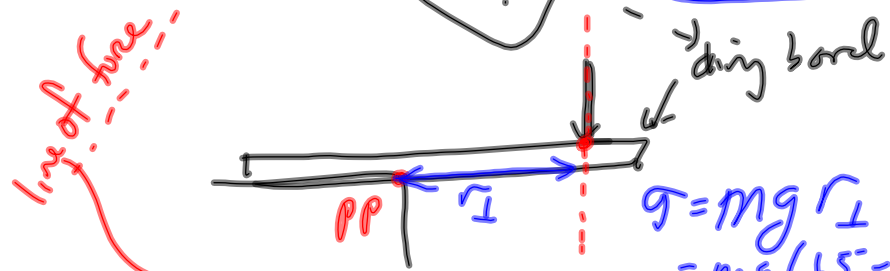


C8 Torque ~ twisting force

$$\tau = Fr_{\perp}$$

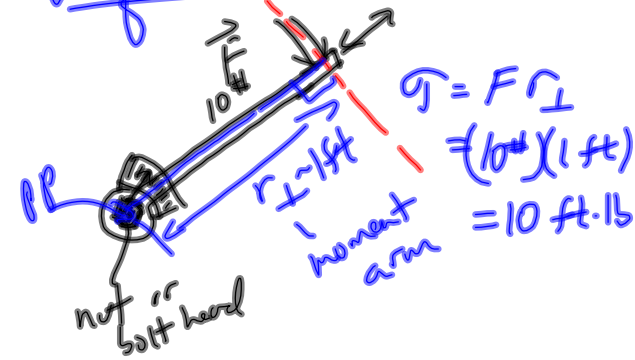


~ pivot point technically arb.
 r_{\perp} ~ shortest dist. f/line of action to PP

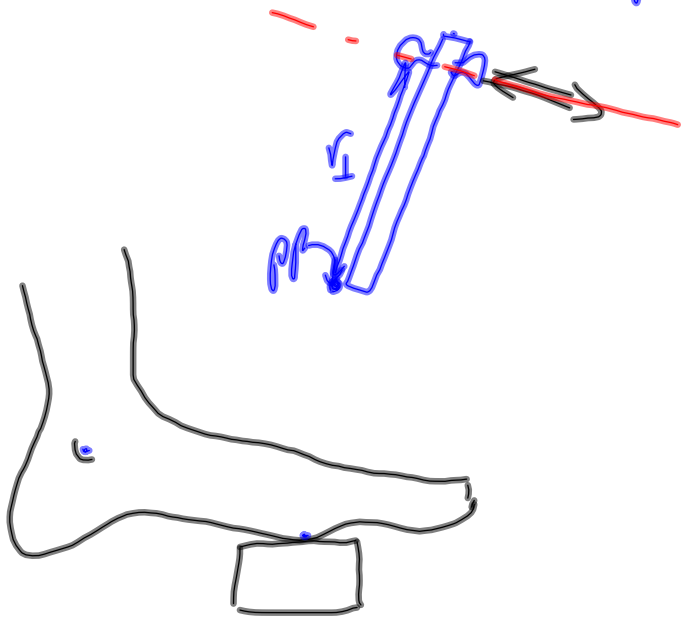
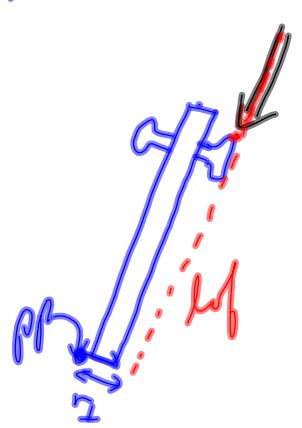


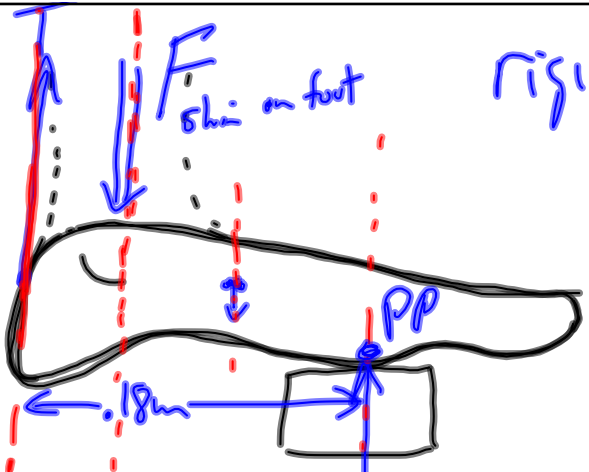
$$\begin{aligned} \tau &= mg r_{\perp} \\ &= mg (.65 - .13) \\ &= 800N (.52 \text{ m}) \\ &= 416 \text{ Nm} \end{aligned}$$

Torque Wrench



$$\begin{aligned} \tau &= Fr_{\perp} \\ &= (10)(1 \text{ ft}) \\ &= 10 \text{ ft}\cdot\text{lb} \end{aligned}$$





rigid body = foot
FBD of foot

$F_{shin} \sim r_{\perp} = .12m$
 $\tau_{shin} = \underline{F}(.12)$
 CCW

$F_{floor on ft} = N = m_{foot}g = 800N$
 $r_{\perp} = 0$

of $T_{Achilles}$

$\tau_{Ach} = T(.18) \text{ CW}$

In equil. $\tau_{net} = 0$
 $.18T = .12F$
 & $\Sigma F_x = 0$

$+T - F + mg = 0$

$T = F - mg$

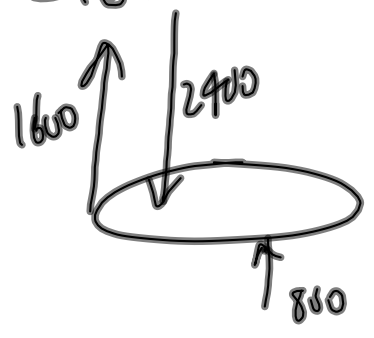
So $.18(F - mg) = .12F$

$.18F - .18mg = .12F$

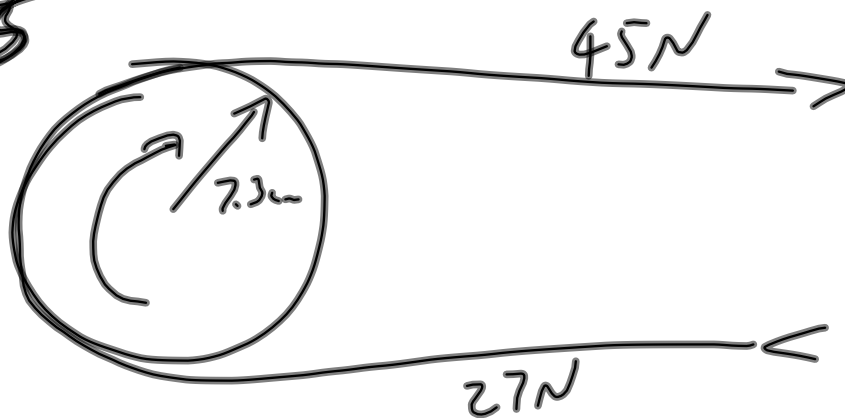
$.06F = .18mg$

$F = \frac{.18}{.06} mg = \frac{.18}{.06} (800N)$
 $= 2400N$

$T = 2400 - 800$
 $= 1600N$



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PP 5



$$W = F d$$
$$T 2\pi r$$