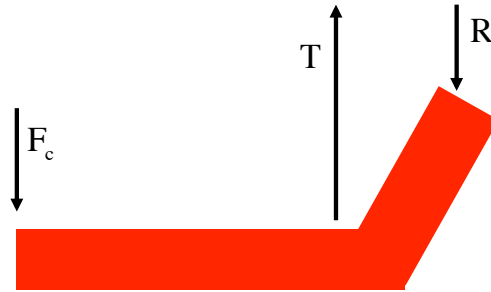
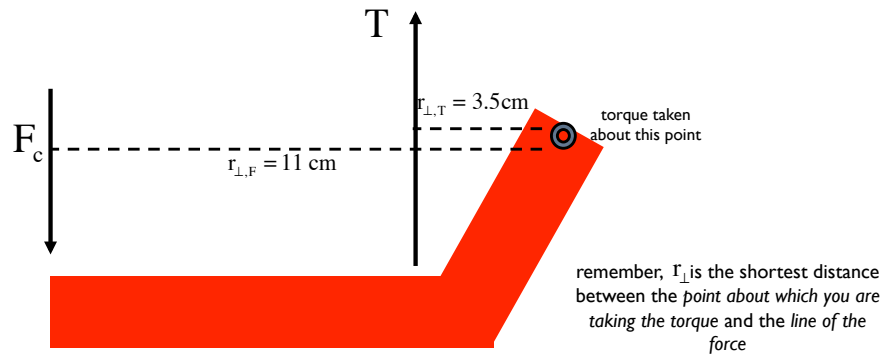


Problem 8.27:

T is the force provided by the chewing muscle, R the force provided by the joint and F_c , the force generated by chewing food. If F_c is 50 N's, what is R and T?



Summing the torques about the pivot allows us to ignore R. The information needed to do the remaining torque calculations is provided below:



1.)

Summing the torques about the pivot allows us to ignore R and leave us with:

$$\begin{aligned} \sum \Gamma_R : \\ \Gamma_F + \Gamma_T + \cancel{\Gamma_R} &= I \cancel{\alpha} = 0 \\ \Rightarrow F_c r_{\perp,F} - T r_{\perp,T} &= 0 \\ \Rightarrow (50\text{N})(.11\text{m}) - T(.035) &= 0 \\ \Rightarrow T &= 157 \text{ N} \end{aligned}$$

With this, all we need to do is sum the forces in the "y" direction to get "R."

$$\begin{aligned} \sum F_y : \\ T - F_c - R &= m \cancel{a} = 0 \\ \Rightarrow R &= T - F_c \\ &= (157 \text{ N}) - (50 \text{ N}) \\ &= (107 \text{ N}) \end{aligned}$$

2.)