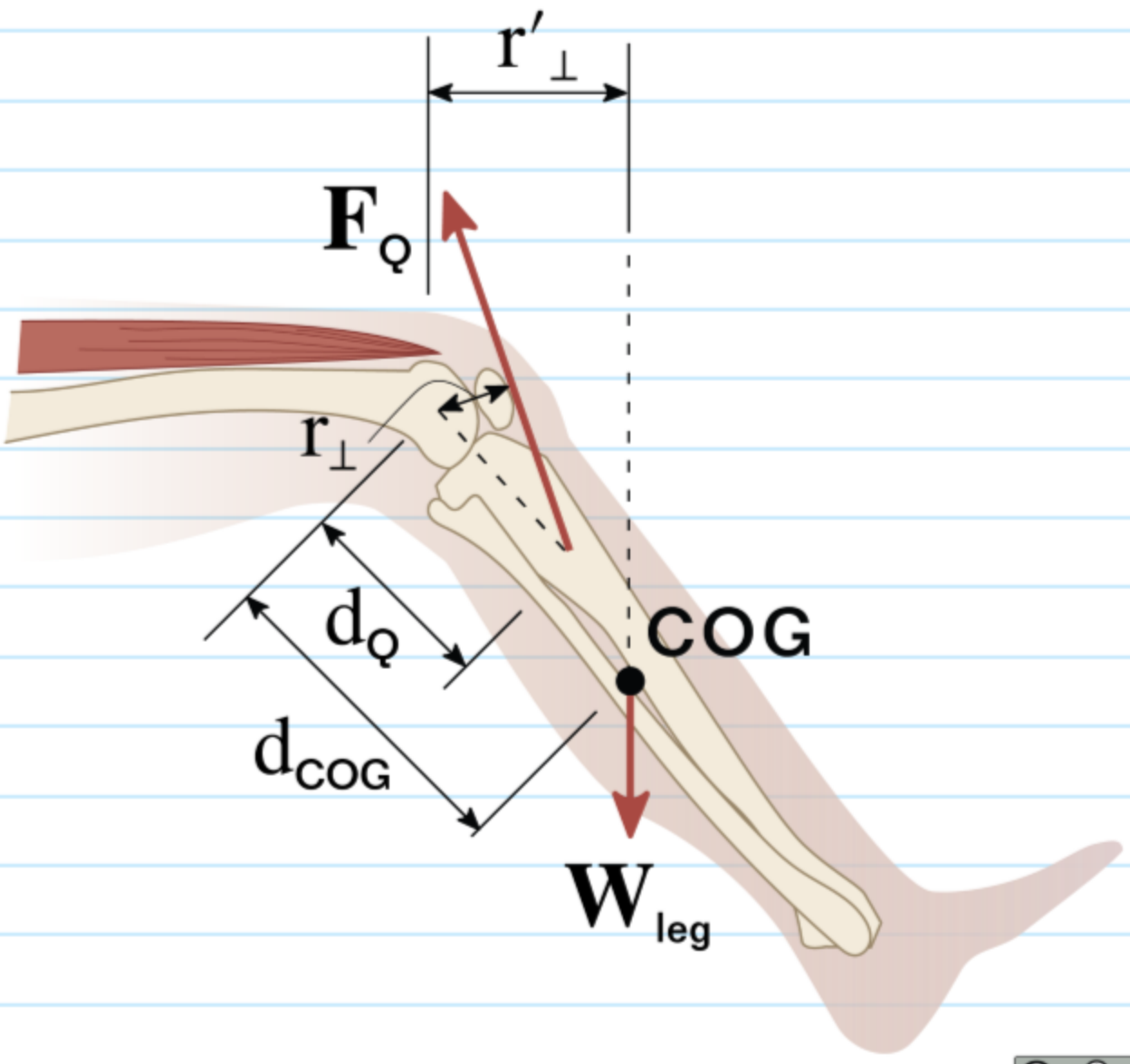
21-S-5-4-GD-001



When someone holds out their leg at an angle as shown in the diagram, what is the force exerted by the quadriceps or F_Q?

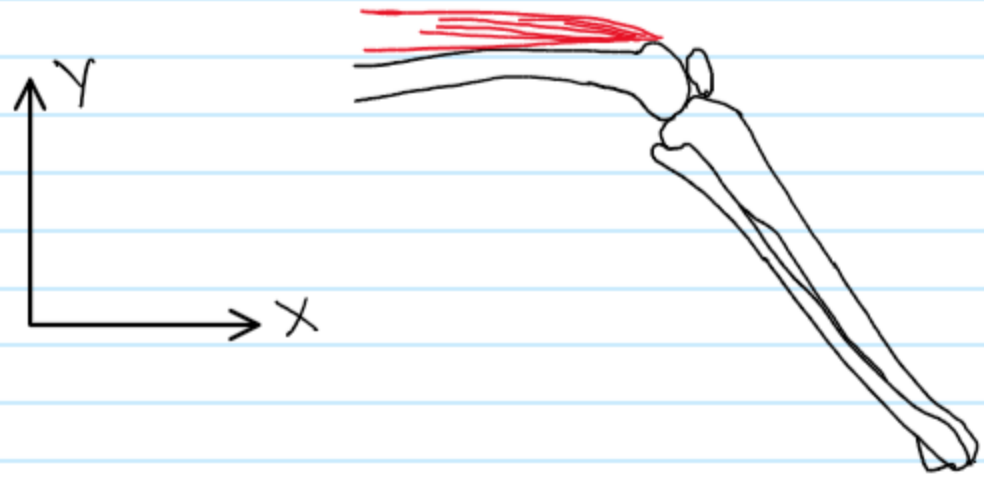
(The leg has a mass of $\underline{m}$ kg, $r_\perp = \underline{r}_\perp$ cm, and $r'_\perp = \underline{r}'_\perp$ cm)

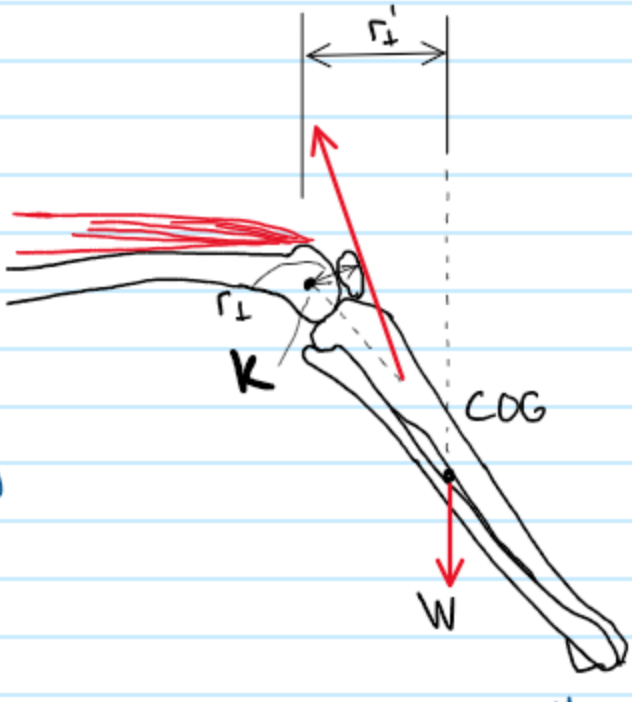
given

$m, r_\perp, r_\perp'$ (convert cm to m for computation)

find

F_Q





$W = mg$

The moment arms are given for the two forces

$+\circlearrowleft \Sigma M_K = 0 = F_Q(r_\perp) - W(r_\perp')$

$$F_Q = \frac{W(r_\perp')}{r_\perp}$$