

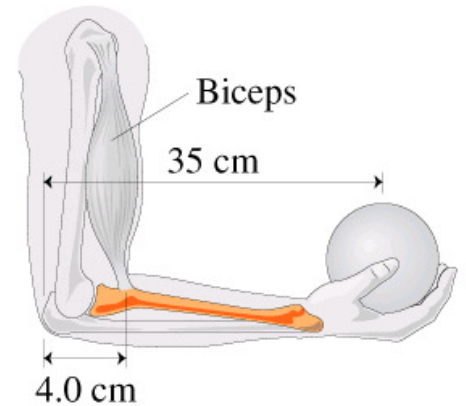
Quiz 2b

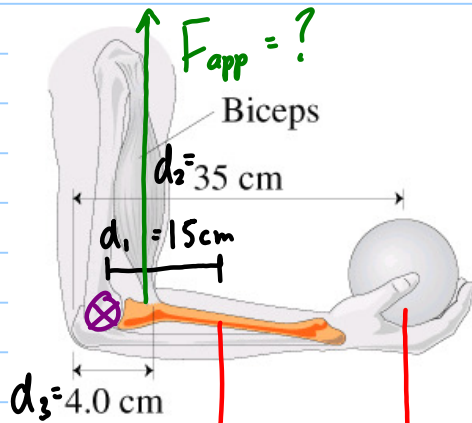
Note Title

14/11/2011

How much force is exerted by the bicep muscle shown when holding on to a 3.0 kg ball?

Assume that the mass of the forearm is 2.2 kg and that its center of mass is located 15 cm from the elbow.





$$\begin{aligned}
 F_{g1} &= m_1 g \\
 &= (2.2)(9.8) \\
 &= 21.56 \text{ N}
 \end{aligned}$$

$$\begin{aligned}
 F_{g2} &= m_2 g \\
 &= (3.0)(9.8) \\
 &= 29.4 \text{ N}
 \end{aligned}$$

$$\tau_c = \tau_{cc} \quad \checkmark$$

$$F_{app} d_3 = F_{g1} d_1 + F_{g2} d_2 \quad \checkmark$$

$$\begin{aligned}
 F_{app} &= \frac{F_{g1} d_1 + F_{g2} d_2}{d_3} \\
 &= \frac{(21.56 \text{ N})(0.15 \text{ m}) + (29.4 \text{ N})(0.35 \text{ m})}{0.04 \text{ m}} \\
 &= \boxed{338 \text{ N}} \quad \checkmark \checkmark
 \end{aligned}$$