Name: _____ Date:_____

Mr. Croom's Physics Chapter 7: Rotational motion

Torque 3

Solve the following problems

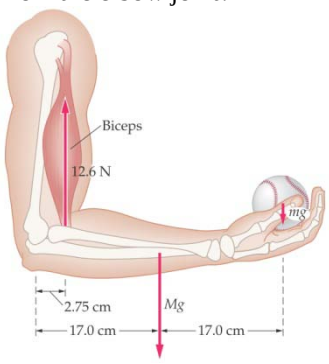
1. A 400 N child and a 300 N child sit on either end of a 2 m long seesaw. Where along the seesaw should the pivot support be placed to ensure rotational equilibrium? Assume the center of mass of the board is where you place the fulcrum.

2. A uniform meter stick, supported at the 30 cm mark is balanced when a 0.5 N weight is hung at the 0 cm mark. What is the weight of the meter stick? (Remember, lever arm is measured from point of pivot to the center of gravity!)

3. The fulcrum of a uniform 0.75N meter stick is at the 70 cm mark. If a weight of 30 N is hung at the 40 cm mark, where do you need to put a 100 N weight to balance out the meter stick?

4. What factor determines the location of the pivot point in a torque problem?

5. (Walker, p. 342, #5) A person holds a 1.42-N baseball in his hand, a distance of 34.0 cm from the elbow joint, as shown in figure b**elow** The biceps, attached at a distance of 2.75 cm from the elbow, exerts an upward force of 12.6 N on the forearm. Consider the forearm and hand to be a uniform rod with a mass of 1.20 kg. **(a)** Calculate the net torque acting on the forearm and hand. Use the elbow joint as the axis of rotation. **(b)** If the net torque obtained in part (a) is nonzero, in which direction will the forearm and hand rotate? **(c)** Would the net torque exerted on the forearm and hand increase or decrease if the biceps were attached farther from the elbow joint?



6. Three children are sitting on a uniform 4m long 10kg board. The board is sitting on top of a log at its 1.5m mark creating a see-saw. A 70kg child is sitting at the 0.0 m mark. A 50 kg child is sitting at the 4.0 m mark. Where do you place the 3rd child who has a mass of 30kg to put the system into rotational equilibrium.