Angular Review

1. A 60 cm diameter wheel rotates through 50 rad. What distance will it move?
b) How many times will the wheel rotate in this time?

2. A saw blade is spinning at 2000 rpm. What is its angular velocity?
b) Through how many radians will it spin in 2 seconds?
c) How fast are the blade tips moving if the blade has a 30 cm diameter?

3. A rotating satellite has the same angular velocity as the earth. If the satellite is 5 x 10^7 m from the center of the earth, what is its tangential velocity?

4. Find the moment of inertia of a 200 gram sawblade that is 30 cm in diameter.

5. What angular acceleration will result if the blade in #4 is acted upon by a 10 Nm torque?
b) How long will it take to spin the blade up to its operating speed of 3000 rad/sec?

6. A pitcher throws a ball by rotating his arm around his shoulder joint. If the ball is 0.05 kg and his arm is 5 kg and 0.8 m long, what torque is required of the shoulder to accelerate the arm at 25 rad/s²? Assume the arm is a solid stick and the ball is a point mass.

7. A string is wound around the flywheel of a motor that is 20 cm in diameter. If a boy pulls the string with 40 N of force, what torque will he produce?
b) What angular acceleration will he produce if the flywheel is a solid disc with mass=2 kg?