1. A young girl with a mass of 30 kg sits in a wagon that has a mass of 289 kg. Beside her is a large pile of identical bowling balls, each of which has a mass of 5 kg. She throws these from the back of the wagon, perfectly horizontally, each with a speed of 7 m/s (she's a *very* strong girl!) at a rate of one every two seconds. What average force does the cart experience?

2. What is the angular speed of the Earth?

3. The radius of the Earth is approximately 6350 km.

    a) What is the linear (i.e., tangential) speed of a point on the equator?

    b) What is the linear speed of Edwardsville?

4.   Superman pushes on the Earth. If he wishes to stop the rotation of the Earth in one hour, what angular acceleration must he provide (assuming it accelerates at a constant rate)?

5.   Superman pushes on the Earth. If he stops the rotation of the Earth in one hour, at a constant angular acceleration, what angle will the Earth rotate while this is happening? (Note that angles greater than 2π are entirely acceptable.)

6. Consider again the situation in the previous problem. What average power did Superman exert to accomplish his task?