Note: Students are encouraged to work together and discuss the problems. However, each student must arrive at her/his own final answers. Show all your work. Simply copied homework will result in zero.

1. (10 points) The current world record for the women's hammer throw was set by Anita Włodarczyk in 2009. In the women's hammer throw competition, a 4-kg steel ball attached at the end of a 119.5-cm wire is wound around and thrown. If the steel ball is revolving uniformly in a horizontal circle and it takes 0.5 s for the ball to make one complete revolution: (a) What is the moment of Inertia (rotational mass) of the ball about the center of the rotation? (Ignore the size of the ball.) (b) What is the angular momentum of the ball about the center of the rotation?

2. (10 points) A 92 mph slider thrown by NY Mets Ace Noah Syndergaard spins at a rate of 2200 rpm. (a) What is the angular momentum of the slider? (b) If it takes 0.05 s for him to spin the ball from rest when he pitches, what is the torque he applies to the ball? A baseball is 0.14 kg in mass and 9.25 inches in circumference.

3. (10 points) Scott Hamilton, a figure skater starts his spin at an initial angular velocity of 1.5 spins (rotations) per second while keeping his arms and legs stretched out. Moments later he pulls his arms and legs inward tightly making himself spin rapidly. If we assume, there is no friction and his initial moment of inertia (rotational inertia) is 6.8 kg m^2 and his final moment of inertia is 2.3 kg m^2, what is his final angular velocity?

4. (10 points) Simone Biles can reduce her rotational inertia by a factor of about 2.9 when changing from a straight position to a tuck position. If it takes her 0.3 s to make one full rotation (or revolution) in a straight position, what is her angular speed when in a tuck position? Provide your answer in rev/s as well as in rad/s.