AN UNBEATABLE FASTBALL

Bet you can't beat me in a rolling contest!

THE SETUP
This is a contest for 3 people. Each person chooses an object from one of these groups:
• spheres: marbles, golf balls, ball bearings (be sure they are solid balls, not hollow like a Ping-Pong ball)
• discs: checkers, plastic plates, coasters
• hoops: rings, tires, hula hoops
The contest must take place on an incline. Choose a slanted board or a smooth sloping driveway depending on the size of the objects chosen. At a signal, let all three objects roll toward a finish line.

INSIDER INFORMATION
No one will beat you if you choose your objects from the groups of spheres. All spheres will beat all discs which will beat all hoops. We mean ALL. It doesn’t matter how heavy or how big the objects are. Rolling speed is directly related to the distribution of weight around an object’s center of gravity, known as its “moment of inertia.” In all three kinds of objects, the center of gravity is the geometric center. But the weights are distributed differently. In the case of the hoop, all the weight is located away from the center of gravity. Of the three types of objects, it has the largest moment of inertia. The solid ball has the smallest since its weight is most closely distributed around its center of gravity. The closer the mass or weight of an object is to its center of gravity, the smaller its moment of inertia and the faster it can rotate.
You’ve seen this principle at work as an ice skater goes into a spin. The spin begins with the arms extended. As the spin progresses, the arms are drawn toward the body, decreasing the moment of inertia by bringing the weight close to the center, and thus increasing the velocity of the spin.