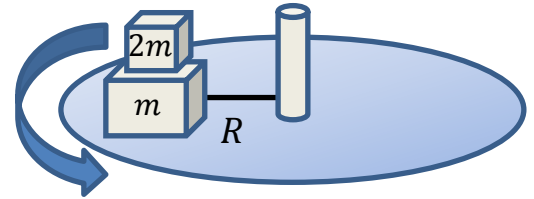**Closed book. Duration:**

Name: Student ID: Signature:

A box of mass 2m is placed on another box of mass m on a frictionless table. The box m is attached by a massless string of length R to a pivot and the boxes are in uniform circular motion together. The static friction coefficient between the boxes is $\mu_s = 0.75$. Find the tension in the string just before the box at the top of the other starts to slide.

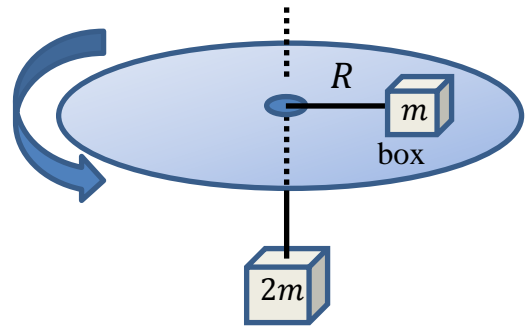A circular plate can rotate around an axis about its center as shown in the figure. A box of mass m is placed at a distance R from the center axis and it is connected by a massless rope through a hole at the center of the plate to another object of mass 2m. The static friction coefficient between the plate and the box is μ_s=0.75. Assume that the rope is free to move (without friction) through the hole. Determine the minimum linear speed of the box during uniform circular motion so that the box does not slide.

Closed book. Duration:

Name: **Student ID:**   **Signature:**

A circular plate can rotate around an axis about its center as shown in the figure. A box of mass 2m is placed at a distance R from the center axis and it is connected by a massless rope through a hole at the center of the plate to another object of mass m. The static friction coefficient between the plate and the box is μ_s=0.75. Assume that the rope is free to move (without friction) through the hole. Determine the maximum linear speed of the box during uniform circular motion so that the box does not slide.