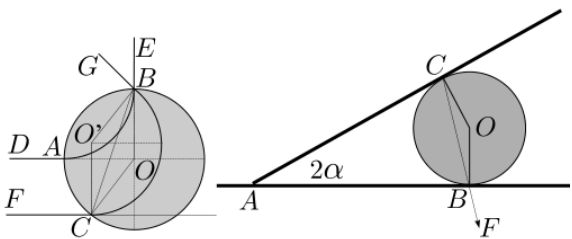
5. Ball (9 points)

We lay one of the rulers horizontally on the table. Then, we put the ball on that ruler, and the other ruler laying on the ball. With finger, we keep one end of the second ruler in contact with the first ruler and find the closest stable position of the ball (resulting in the largest inclination angle of the second ruler), see Figure.



Now, we consider the torque balance (for the ball) with respect to the ball and ruler touching point B. Gravity force has no torque, because it is applied to the centre of the ball O. So, the resultant vector of the friction and reaction forces at C must have also zero torque, i.e. it has to go through B. At the threshold of sliding, the angle between this vector and the surface normal CO is $\arctan\mu$. So, $\mu = \tan\angle BCO = \tan\angle OAB = |OB|/|AB| = R/|AB|$. The radius of the ball $R \approx 40\,\mathrm{mm}$ can be measured by rolling the ball on the ruler by angle 2π. The distance $|AB|$ can be measured directly using the ruler. Several measurements are needed, to find the critical position of the ball more accurately.

We have used one ruler as the basis, because if the surface has smaller coefficient of friction than the ruler, the sliding starts at the point B, hence we are not able to obtain the required result.