A uniform rod of mass M and length L is placed at right angles to an edge of a horizontal table. The center of mass C of the rod projects a distance d beyond the edge at A. The coefficient of static friction equals μ. The rod, flat on the table, is released at rest. It starts to rotate about A and eventually slides off the table.

(a) Calculate the moments of inertia of the rod, I_C about point C and I_A about point A. You may express the answers for parts (b)-(d) below in terms of I_C and I_A.

(b) Calculate the angular velocity ω of the rod as a function of the rotation angle θ before sliding occurs.

(c) The force acting on the rod by the table edge has a component in a direction perpendicular to the rod. Calculate this component N as a function of θ before sliding occurs.

(d) Calculate the angle θ when sliding begins.