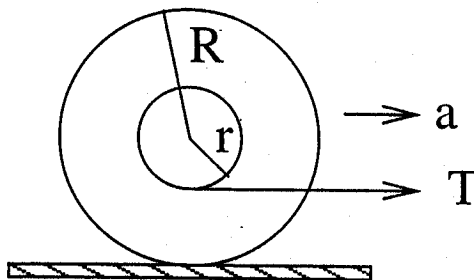


QP 25

Problem 2 (5 points)

A yo-yo has mass m , inner radius r , and outer radius R . Its moment of inertia is I about its center. The yo-yo rolls without slipping on a horizontal table, and is pulled along by a horizontal string wound around its inner radius. The pulling by the string gives rise to an acceleration a .



- (a) (3 points) Find the tension T in the string, and the force of friction f .
- (b) (1 point) Find the minimum coefficient of friction μ_{min} so that the yo-yo rolls without slipping. If $I = kmR^2$, find μ_{min} in terms of k , a , and g .
- (c) (1 point) In the picture, in what direction does the yo-yo roll? Explain.