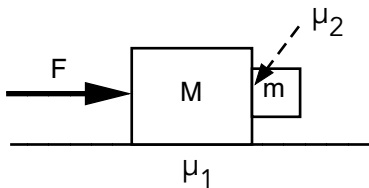# Force Problems IV

Include a correctly labeled free body diagram in each problem.

1. The Turkish Twist is a classic amusement park ride in which the riders stand in a tube. The tube spins around, and then the floor drops down, leaving the riders stuck to the wall. If the radius of the tube is 3 meters, and the coefficient of friction between the rider and the wall is 0.4, what is the minimum rotation speed (in rpm) of the ride?

2. A force F is pushing a big box M, which in turn is pushing a little box m, as shown in the diagram. The coefficients of friction are as shown. What is the minimum force F so that m stays suspended?

3. A car is driving around a curved, banked road, base angle θ and
    radius r. If the coefficient of friction between the tires and the road
    is μ, what is the fastest the car can travel around the curve without
    sliding.

Answers

1) 27.6 rpm

2) F = (μ_1 + 1/μ_2)(m_1 + m_2)g

3) v^2 = rg[(sinθ +μcosθ)/(cosθ – μsinθ)]