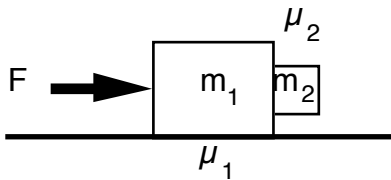


Force Problems IV

Include a correctly labeled free body diagram in each problem.

- 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?

- 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?



- 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. $F = (\mu_1 + 1/\mu_2)(m_1 + m_2)g$

3. $v^2 = rg[(\sin\theta + \mu\cos\theta)/(\cos\theta - \mu\sin\theta)]$