

Problems of the Week 11

Always show your work to receive credit (NO WORK=NO CREDIT)

1. A stick of length $L=1.0\text{m}$ and mass $M=0.50\text{kg}$ initially vertical on a frictionless horizontal surface, starts falling. What is the speed of the center of mass of the stick when it makes a 45° angle with the horizontal surface?
- A. 0.84m/s B. 1.31m/s C. 1.81m/s D. 2.47m/s E. 3.01m/s

2. A 161lb man is freely standing (not holding onto anything) in a railroad car traveling at a constant speed of 15.0mph as it goes around a curve. The center of mass of the man is $R=75\text{ft}$ from the center of the curve. The front of his body is facing the direction of motion of the train. His feet are 2.5ft apart and his center of mass is 3ft above the railroad car floor. Calculate the normal force exerted by the floor each foot.
- A. $63\text{lb}, 98\text{lb}$ B. $80.5\text{lb}, 80.5\text{lb}$ C. $42\text{lb}, 119\text{lb}$
D. $57\text{lb}, 104\text{lb}$ E. $32\text{lb}, 129\text{lb}$