

PHY151 Practical Questions for Oct 3 to 7

1. A 6.5-cm-diameter ball has a terminal speed of 26 m/s. What is the ball's mass?
2. You pull a 45 kg block down a ramp. The rope is horizontal and exerts a force of 220 N. The coefficient of kinetic friction is 0.75. The ramp has an angle of 20 degrees from the horizontal. What is the acceleration of the block? Is the block speeding up or slowing down?
3. Modelling question: Estimate the force needed to keep a loaded (non-empty) transport truck travelling at constant speed on a highway.
4. What's the optimal angle (θ) to pull a box (m) across grass (coefficient of friction μ_k) at constant speed (v) such that the tension is minimized? No numbers, just variables. *Hint:* find tension as a function of θ and then find the angle which has the minimum value of tension.