Reading Questions for Week 2 Day 2

Write your name, section, and table number where you sit on the upper right hand corner of your paper and hand it in at the start of class that day in the appropriate box on the first table by the door as you enter 26-152.

Sept 11/12 W02D02 Applications of Newton’s Second Law
Reading Assignment:
Chapter 7 Newton’s Laws of Motion, Sections 7.1-7.4
Chapter 8 Applications of Newton’s Second Law, Sections 8.1-8.4.1

Reading Question RQ_W02D2-1 (5 points):

The static friction force \( \mathbf{f}_s \) can have a magnitude \( |\mathbf{f}_s| = f_s \leq \mu_s N \) (Eq. 5.6). Suppose you have a block with a rope attached on opposite sides (right and left sides). (a) Describe the direction and magnitude of the static friction force as you increase your pull on the right side until the block just slips. (b) Describe the direction and magnitude of the static friction force as you increase your pull on the left side until the block just slips. (c). Describe the direction and magnitude of the static friction force when you pull both sides with the same magnitude of force.

Reading Question RQ_W02D2-2 (5 points):

The magnitude of gravitational force on an object of mass \( m \) at the surface of the earth due to the interaction of the object and the earth is given by \( |\mathbf{F}_{\text{grav}}| = m g_E \) (Eq. 4.10). The magnitude of this force is also given by Eq. 12.2, \( |\mathbf{F}_{\text{grav}}| = G m_E m / R_E^2 \). If you placed the same object on the surface of a planet with the same mass as the earth, \( m_P = m_E \) but only one fifth the mass density, \( \rho_P = (1/5) \rho_E \), what is the ratio of the magnitudes of the gravitational accelerations at the surface of the planet and earth, i.e. what is \( g_P / g_E \)?