

## Prob-Chap03-PHYS-109

3.1. Find the force of gravity between two uniform spheres as they touch each other. Each sphere has a mass of  $m = 15 \text{ kg}$  and a radius of  $r = 0.5 \text{ m}$ . What is the force of gravity between them when they stand (surface to surface)  $2 \text{ m}$  from each other?

3.7. The acceleration of gravity on the surface of Mars is  $3.62 \text{ m/s}^2$ , and the mass of Mars is  $6.40 \times 10^{23} \text{ kg}$ . Find the radius of Mars.

3.25. A  $5.8 \text{ kg}$  box is resting on an inclined surface  $35^\circ$  above the horizontal. Find the normal force exerted by the box on the inclined surface.

3.28. A person pushes on a  $67 \text{ kg}$  refrigerator by a horizontal force of  $276 \text{ N}$ . (a) If the coefficient of static friction is  $0.55$ , what are the magnitude and the direction of the force of the static friction. Does the person move the refrigerator? (b) What is the magnitude of the largest push that the person can apply to the refrigerator just before it begins to move?

3.31. A box of mass  $45.5 \text{ kg}$  is at rest on a horizontal floor. If the coefficient of static friction between the box and the floor is  $0.34$ , what is the minimum force needed for it to start to move?