60. Since all surfaces are frictionless, the contact force $\vec{F}$ exerted by the lower sphere on the upper one is along that 45° line, and the forces exerted by walls and floors are "normal" (perpendicular to the wall and floor surfaces, respectively). Equilibrium of forces on the top sphere lead to the two conditions

$$N_{\text{wall}} = F\cos 45^\circ \qquad \text{and} \qquad F\sin 45^\circ = mg \ .$$

And (using Newton's third law) equilibrium of forces on the bottom sphere lead to the two conditions

$$N'_{\text{wall}} = F\cos 45^\circ \qquad \text{and} \qquad N'_{\text{floor}} = F\sin 45^\circ + mg \ .$$

(a) Solving the above equations, we find $N'_{\text{floor}} = 2mg$.

(b) Also, we obtain $N'_{\text{wall}} = N_{\text{wall}} = mg$.

(c) And we get $F = mg/\sin 45^\circ = mg\sqrt{2}$.