

Question 1

A 10 kg box is at rest on a horizontal surface while a rope pulls on it as illustrated. The coefficient of static friction between the block and surface is $\mu_s = 0.50$.



Which of the following is true?

1. The static friction force is less than 30 N.
2. The static friction force is 30 N.
3. The static friction force is 0.50 N.
4. The static friction force is 49 N ($= \mu_s mg$).

Question 2

A ball falls toward the floor of a spacecraft that is very distant from any planets or stars. It bounces off the floor. Consider the period when the ball is in contact with the floor. Which of the following is true?

1. The only force present is that exerted by the floor on the ball.
2. There are two forces: $\vec{F}_{\text{floor on ball}}$ and $\vec{F}_{\text{ball on floor}}$ and $F_{\text{floor on ball}} > F_{\text{ball on floor}}$.
The net force on the ball is thus non zero.
3. There are two forces: $\vec{F}_{\text{floor on ball}}$ and $\vec{F}_{\text{ball on floor}}$ and $\vec{F}_{\text{floor on ball}} = -\vec{F}_{\text{ball on floor}}$.
The net force on the ball is thus zero.
4. There are two forces: $\vec{F}_{\text{floor on ball}}$ and $\vec{F}_{\text{ball on floor}}$ and $\vec{F}_{\text{floor on ball}} = -\vec{F}_{\text{ball on floor}}$.
The net force on the ball is not zero.