Warm Up Question 1

Two blocks are in contact and move along a horizontal surface (see Fig. 7.12). The mass of block A is a half that of block B. A hand pushes to the right as illustrated and the blocks move together. How does the force exerted on block B compare (same, half, larger, etc...) to that by the hand on block A? Explain your answer.

1. Force on B is smaller. Hand accelerates both A and B. Only A accelerates B.
2. Force on B is smaller. It is $2/3$ the force on A.
3. Force on B is smaller. Otherwise the force by B on A would cancel all forces on A.
4. Force on B is larger. It has a larger mass.
5. Force on B is the same as the hand. Equal and opposite.
6. Force on B is the same as the hand. Same accelerations.

Question 1

A horizontal rope pulls a box with a constant speed along a rough horizontal table. Which of the following is an action/reaction pair?

1. The friction force and the tension in the rope.
2. The gravitational force and the normal force.
3. Both of the above options.
4. Neither of the above options.

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. $F_{\text{floor on ball}} > F_{\text{ball on floor}}$. The net force on the ball is thus non zero.
2. $\vec{\mathrm{F}}_{\text{floor on ball}} = -\vec{\mathrm{F}}_{\text{ball on floor}}$. The net force on the ball is thus zero.
3. $\vec{\mathrm{F}}_{\text{floor on ball}} = -\vec{\mathrm{F}}_{\text{ball on floor}}$. The net force on the ball is not zero.

Warm Up Question 2

Two blocks are connected by a string that runs over a pulley. One block slides along a frictionless horizontal surface and the other is suspended (see Fig. 7.15). The blocks are released and begin to move. How does the tension in the string compare (same, half, larger, etc...) to the gravitational force on the suspended block? Explain your answer.

1. $T < F_g$. Block moves downward.
2. $T < F_g$. Block accelerates downward.
3. $T = F_g$. Newton's Third Law.
4. $T = F_g$. Net force on suspended block is zero.