

IMPORTANT: In answering the following questions, do **not** neglect air resistance!

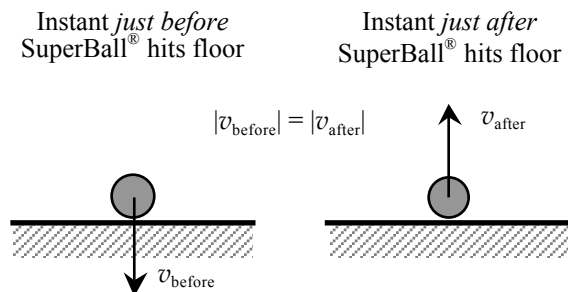
1. You are attending the Muskegon Air Show with your best friend when you watch a skydiver jump from a plane. The skydiver falls freely for a short while before opening her parachute. Soon after the chute has opened, the skydiver descends with constant speed.
 - a. In the space provided below, draw separate free-body diagrams for the system consisting of the skydiver and parachute:
 - i. immediately after the diver has jumped out of the plane, and
 - ii. shortly after the skydiver (with parachute open) begins to move with constant speed.

Clearly label all forces on both free-body diagrams.

- b. Is the net force on the skydiver in case (i) *greater than*, *less than*, or *equal to* the net force on the skydiver in case (ii)? Explain.

2. A SuperBall[®] is dropped to the floor and bounces back straight up. Suppose that the upward speed of the SuperBall immediately after leaving the floor were exactly equal to its downward speed immediately before it reaches the floor.

(Do *not* neglect air resistance in this situation. However, assume that the SuperBall never reaches terminal speed.)



At which instant is the acceleration of the SuperBall *larger* in magnitude: (i) just before it reaches the floor, (ii) just after it leaves the floor, or (iii) is it the same at both instants? Explain.