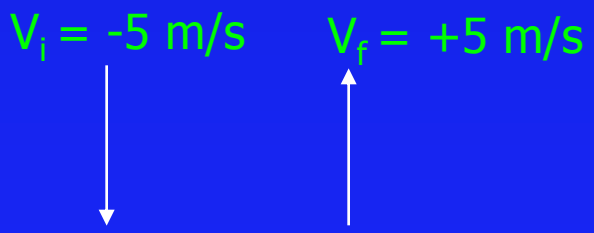
ACT (w/ demo)

Two identical balls are dropped from the same height onto the floor. In each case they have velocity v downward just before hitting the floor. In case 1 the ball bounces back up, and in case 2 the ball sticks to the floor without bouncing. In which case is the magnitude of the impulse given to the ball by the floor the biggest?

A. Case 1 ⟵ correct

B. Case 2

C. The same



Bouncing Ball

$|I| = |\Delta p|$

$= |mv_{final} - m\,v_{initial}|$

$= |m(\,v_{final} - v_{initial})|$

$= 2\,m\,v$

Sticky Ball

$|I| = |\Delta p|$

$= |mv_{final} - m\,v_{initial}|$

$= |m(\,0 - v_{initial})|$

$= m\,v$