With their centers vertically aligned, both balls are released from rest at the same time, to fall through a distance of 1.20 m. What are the velocities of the tennis ball and basketball when they strike the floor?

A. \( v_T = 4.85 \text{ m/s}, \ v_B = -4.85 \text{ m/s} \)
B. \( v_T = -4.85 \text{ m/s}, \ v_B = -4.85 \text{ m/s} \)
C. \( v_T = -4.85 \text{ m/s}, \ v_B = 4.85 \text{ m/s} \)
D. \( v_T = 4.85 \text{ m/s}, \ v_B = 4.85 \text{ m/s} \)

A gun at rest of mass \( M \) shoots a bullet of mass \( m \). If velocity of the bullet is \(+v_b\) what is the velocity of the gun in terms of \( M, m \) and \( v_b \)

A. \(-\frac{m}{M}v_b\)
B. \(\frac{m}{M}v_b\)
C. \(-\frac{M}{m}v_b\)
D. \(\frac{M}{m}v_b\)

What are \( \Delta p \) and \( \Delta KE \) in terms of \( m, M, \) and \( v_b \)?

A. 0 and \(-v_b^2(1+M/m)\)
B. 0 and \((1/2)mv_b^2(1+m/M)\)
C. \(-mv_b^2\) and \((v_bM/m)^2\)
D. \(-mv_b^2\) and \((v_bm/M)^2\)

\[ KE_i = 0 \]
\[ KE_f = (1/2)mv_b^2 + (1/2)M(v_b/M)^2v_b^2 \]

How can the stranded astronaut reach the shuttle?

A. Kick her arms and legs like a swimmer
B. Throw the wrench towards the shuttle
C. Throw the wrench away from the shuttle

NOT FOR POINTS