Mike (200 lb, 8 ft/s) Gonzales (100 lb, 16 ft/s)

Mike (200 lb, 8 ft/s) Pancho (400 lb, 4 ft/s)

Who will be more effective in stopping and hurting Mike?

A) stopping: Gonzales and hurting: Gonzales.
B) stopping: Pancho and hurting: Pancho.
C) stopping: both and hurting: Gonzales.
D) stopping: both and hurting: Pancho.

The sum of the initial momenta equals the final momentum of the two athletes who are now together; i.e.,

\[ m_1 v_1 + m_2 v_2 = (m_1 + m_2) v_f. \]

From Mike: \( p = m v = 1600 \text{ lbf ft/s} \).
Gonzales: \( p = 1600 \text{ lbf ft/s} \).
So for both cases the sum of initial momentum vectors is 0, so \( v_f = 0 \).
Both cases are equally effective in stopping Mike.

The kinetic energy, \( K = \frac{m v^2}{2} = \frac{p^2}{2m} \).
Gonzales’ weight is 4 times lighter than that of poncho.
Having the same momentum, Gonzales’ kinetic energy is 4 times greater.
Upon collision, the kinetic energy is dissipated through work done on the opponent’s body.
Thus \( K = F s \), where \( F \) is the average force exerted on Mike, \( s \) is the distance of compression.
The greater the kinetic energy, the stronger the force and farther the compression is expected.
In turn the collision hurts Mike more.
Answer C.

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