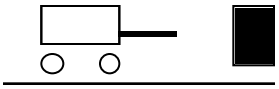
Bouncing Cart—Work Done by the Barrier [61]

A cart with a spring plunger runs into a fixed barrier. The mass of the cart, its velocity just before impact with the barrier, and its velocity right after collision are given in each figure.

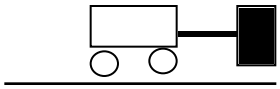
Rank the work done *by* the barrier on each cart from the greatest work done by the barrier to the least work done by the barrier (+ direction is to the right and - to the left with –4 < -2).

A

Before: 10 kg, v_o = 4 m/s

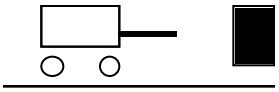


After: 10 kg, v_f = 0 m/s

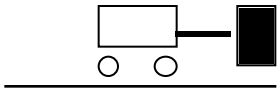


B

Before: 10 kg, v_o = 3 m/s

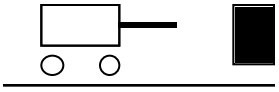


After: 10 kg, v_f = -1 m/s

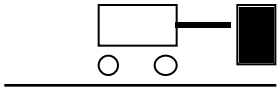


C

Before: 5 kg, v_o = 5 m/s

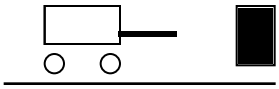


After: 5 kg, v_f = -3 m/s

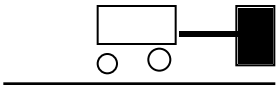


D

Before: 20 kg, v_o = 2 m/s

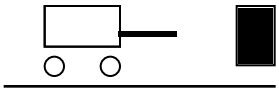


After: 20 kg, v_f = 0 m/s

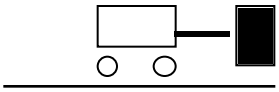


E

Before: 20 kg, v_o = 1 m/s

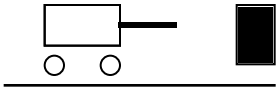


After: 20 kg, v_f = -1 m/s

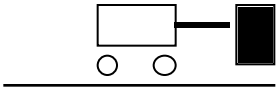


F

Before: 10 kg, v_o = 2 m/s



After: 10 kg, v_f = -2 m/s



Greatest 1_____ 2_____ 3_____ 4_____ 5_____ 6_____ Least

Or, the work done by the barriers is the same for all these cases._____

Or, there is no work done by the barrier for all these cases._____
Please carefully explain your reasoning.
How sure were you of your ranking? (circle one)

Basically Guessed					Sure				Very Sure
1	2	3	4	5	6	7	8	9	10

[61] T. O'Kuma, C. Hieggelke