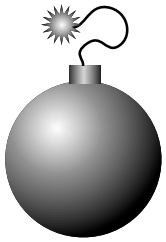
PhyzJob: Conservation of Momentum Number Puzzles

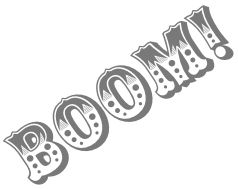
PART 1: MOMENTUM

INSTRUCTIONS: In each of the scenarios below, some information regarding the system (or elements within the system) is given. Provide the missing information based on what you know about conservation of momentum.

One Dimension

1. The Stationary Bomb Explodes.

BEFORE 



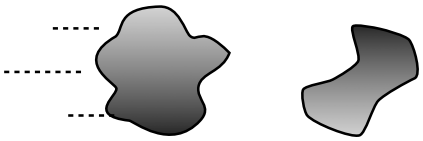
AFTER

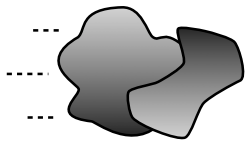
$p = 0$

$p' =$ _____ $= p_1' + p_2'$

$p_1' = -10$ kg·m/s $p_2' =$ _____

2. A Blob of Clay Collides With a Stationary Blob of Clay.



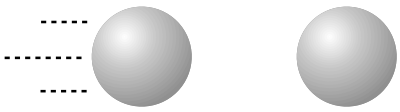


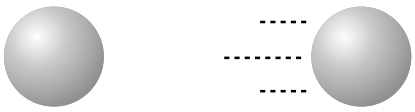
$p_1 = 10$ kg·m/s $p_2 = 0$

$p_1 + p_2 = p =$ _____

$p' =$ _____

3. A Metal Ball Collides With a Stationary Metal Ball.





$p_1 = 10$ kg·m/s $p_2 = 0$

$p_1 + p_2 = p =$ _____

$p' =$ _____ $= p_1' + p_2'$

$p_1' = 0$ $p_2' =$ _____

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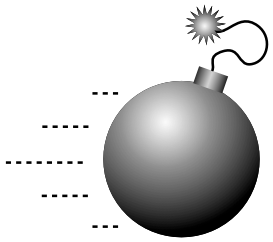
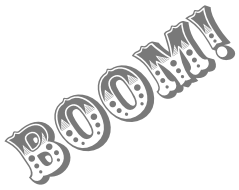
4. A Moving Bomb Explodes.



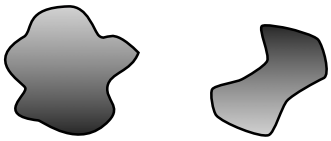


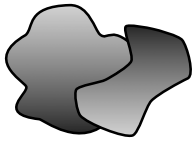
$p = 10\ kg{\cdot}m/s$

$p' =$ _____ $= p_1' + p_2'$

$p_1' = -10\ kg{\cdot}m/s$ $p_2' =$ _____

5. Moving Blobs of Clay Collide. (YOU draw the "speed lines.")





$p_1 = +10\ kg{\cdot}m/s$ $p_2 =$ _____ $p' = +4\ kg{\cdot}m/s$

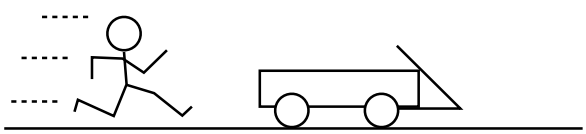
$p_1 + p_2 = p =$ _____

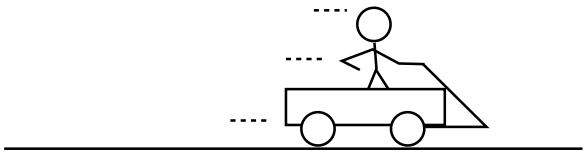
6. Moving Metal Balls Collide. (YOU draw the "speed lines.")

$p_1 = +10\ kg{\cdot}m/s$ $p_2 = -13\ kg{\cdot}m/s$ $p' =$ _____ $= p_1' + p_2'$

$p_1 + p_2 = p =$ _____ $p_1' = -8\ kg{\cdot}m/s$ $p_2' =$ _____

7. A New Kind of Mystery. A Running Child Jumps Into a Stationary Wagon.





$m_1 = 40\ kg$ $m_2 = 10\ kg$ $v_2' =$ _____

$v_1 = 5.0\ m/s$ $v_2 = 0$

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