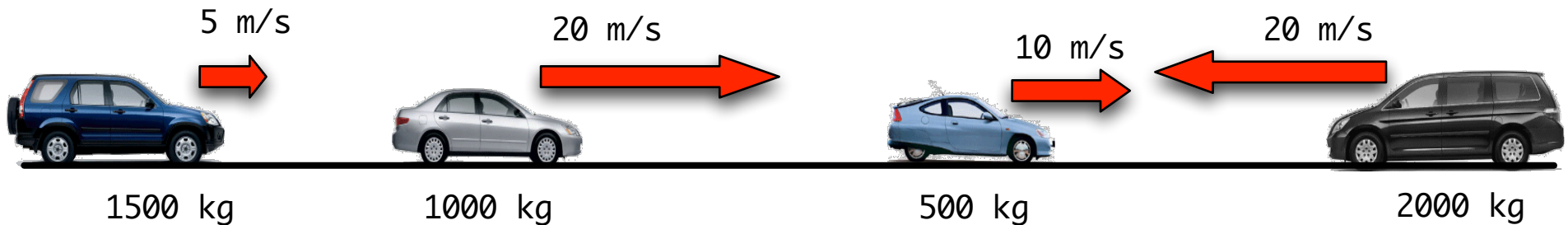


Part 1: Finding Total Momentum of a System



$$P_{\text{total}} = (1500 \text{ kg})(5 \text{ m/s}) + (1000 \text{ kg})(20 \text{ m/s}) + (500 \text{ kg})(10 \text{ m/s}) + (2000 \text{ kg})(-20 \text{ m/s})$$

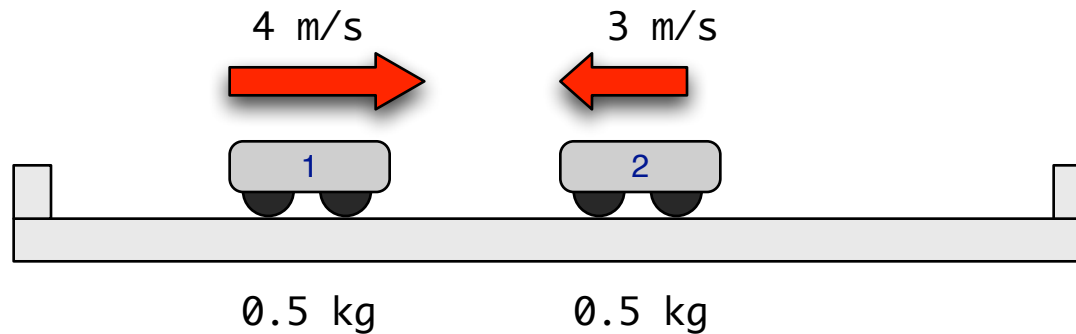
left = negative!

$$P_{\text{total}} = (7,500 \text{ kg /s}) + (20,000 \text{ kgm/s}) + (5,000 \text{ kgm/s}) + (-40,000 \text{ kgm/s})$$

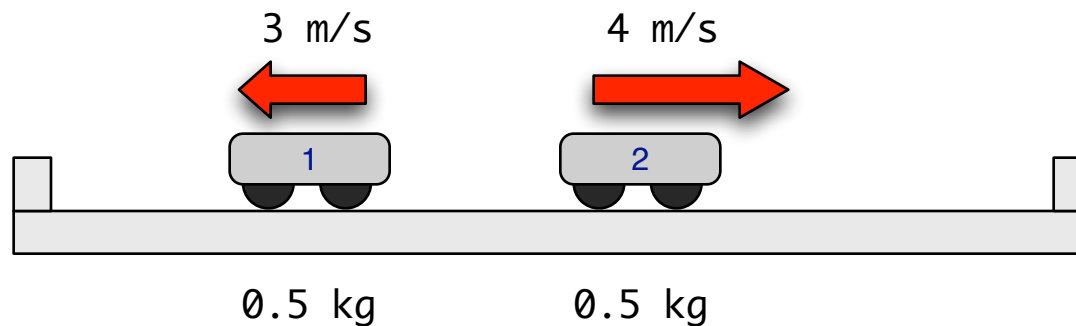
$$P_{\text{total}} = (7,500 \text{ kg /s}) + (20,000 \text{ kgm/s}) + (5,000 \text{ kgm/s}) + (-40,000 \text{ kgm/s})$$

$$P_{\text{total}} = -7,500 \text{ kgm/s}$$

Part 2: Tricks for Finding Final Velocities for Elastic (Perfect) Collisions (linear - same masses)

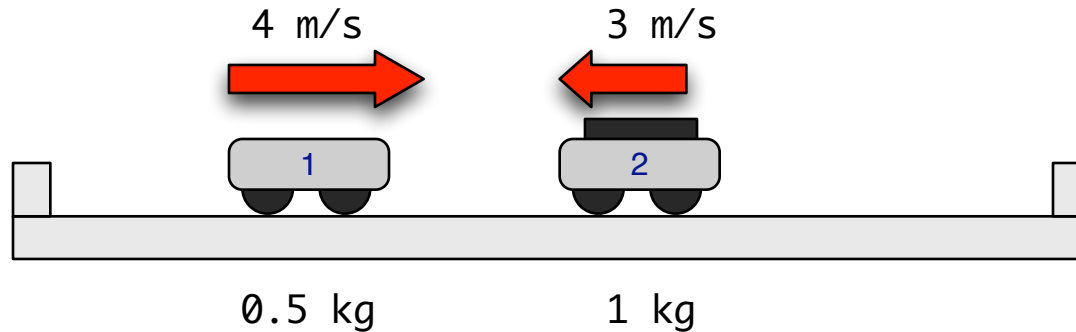


Velocities Switch!

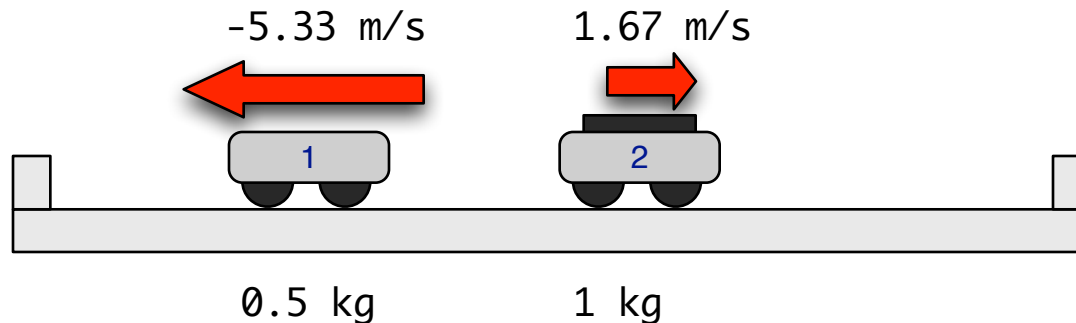


Click here to try it at mrmont.com

Part 2: Tricks for Finding Final Velocities for Elastic (Perfect) Collisions (linear - different or same masses)



Sum of 1's velocities = Sum of 2's velocities

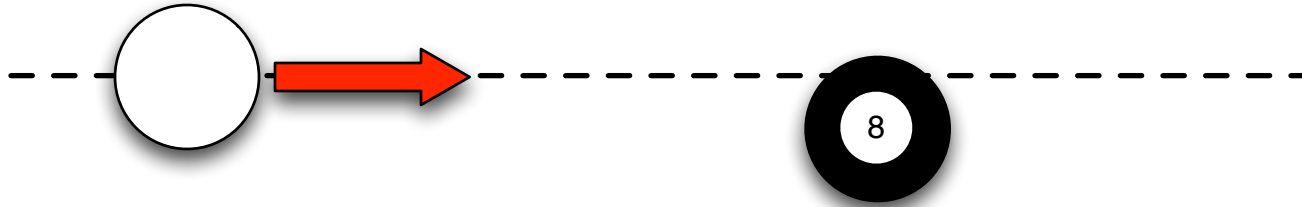


$$4 \text{ m/s} + -5.33 \text{ m/s} = -3 \text{ m/s} + 1.67 \text{ m/s}$$

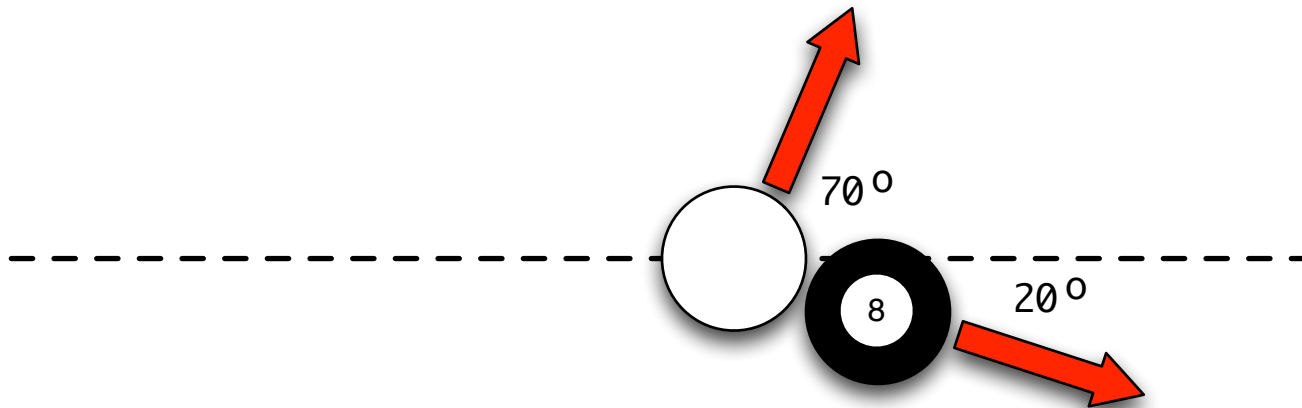
$$1.33 \text{ m/s} = 1.33 \text{ m/s}$$

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Part 2: Tricks for Finding Final Velocities for Elastic (Perfect) Collisions (2-D - same masses)



They separate at 90 degrees!



*Handy for playing pool where the cue ball is nearly the same mass as the others.
You'll never scratch again!*