

Example 1:

Two balls of mass m_1 and m_2 , with velocities v_1 and v_2 collide head on. Is there any way for both balls to have zero velocity after the collision? If so, find the conditions under which this can occur.

ANSWER: YES, if they're momentum is equal in magnitude, but opposite in direction. Example; an car traveling west with a momentum of 200kg.m/s ,another car is traveling east with a momentum of 200kg.m/s. Their momentums cancel out.

Example 2:

A car of 500 kg, traveling at 30 m/s rear ends another car of 600 kg, traveling at 20 m/s in the same direction. The collision is great enough that the two cars stick together after they collide. How fast will both cars be going after the collision? **ANS: 24m/s**

Example 3:

A 100kg astronaut is floating in space and is holding a 20kg oxygen tank. If he throws the tank at a speed of 6.0m/s, what is the velocity of the astronaut? **ANS: 1.2m/s**

Example 4:

A 1.2kg cue ball is traveling to the right at 3.0m/s. At the same time, a 3.0kg cue ball is traveling to the left at 4.0m/s. After the collision, the 1.2kg ball is traveling at 3.0m/s to the left. What is the velocity of the 3.0kg ball after the collision? **ANS: 1.6 m/s**