

The following questions are worth 10 pts each

Record your steps! (Grade based on method displayed not just numerical result)

14. Particles 1 and 2 collide in space where no external forces are present. Particle 1, with mass $m_1 = 2$ kg, moves parallel to the x axis and collides with particle 2 (which has mass $m_2 = 3$ kg). The below lists a pre-collision (unprimed) and a post-collision (primed) velocity (in m/s). The x and y velocities are listed as an ordered pair: $\vec{v} = (v_x, v_y)$.

particle mass	pre-collision velocity	post-collision velocity
$m_1 = 2$	$\vec{v}_1 = (-5, 0)$	$\vec{v}'_1 = \left(\frac{2}{5}, \frac{9}{5}\right)$
$m_2 = 3$	$\vec{v}_2 = (0, 0)$	$\vec{v}'_2 = \left(-\frac{18}{5}, -\frac{6}{5}\right)$

- A. Show that the initial momentum in the x direction equals the final momentum in the x direction.
B. Show that the initial momentum in the y direction equals the final momentum in the y direction.
C. Calculate the total kinetic energy in the pre-collision state and in the post-collision state. Is this an elastic collision?

