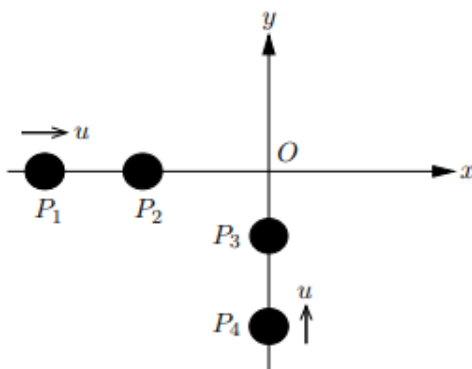


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Four particles P_1 , P_2 , P_3 and P_4 , of masses m_1 , m_2 , m_3 and m_4 , respectively, are arranged on smooth horizontal axes as shown in the diagram.

Initially, P_2 and P_3 are stationary, and both P_1 and P_4 are moving towards O with speed u . Then P_1 and P_2 collide, at the same moment as P_4 and P_3 collide. Subsequently, P_2 and P_3 collide at O , as do P_1 and P_4 some time later. The coefficient of restitution between each pair of particles is e , and $e > 0$.

Show that initially P_2 and P_3 are equidistant from O .



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