

STEP III, 2005, Q9 EC

- 9 This was the most popular Mechanics question and most of those who attempted it seemed to know what to do, though those who had a formulaic approach to Newton's Law of restitution, writing it as $-e = \frac{\text{difference of final velocities}}{\text{difference of initial velocities}}$, frequently made at least one sign error in using this equation, and there were many who did not make a consistent decision about the sign convention for the final velocities, for instance by drawing a diagram. However, virtually all were defeated by the algebra required – it was very common indeed, for instance, to see the expression $(1-e)^2$ miscopied as $(1-e^2)$ at some point in the calculation, or vice versa. Unfortunately, the problem was unforgiving about this, and incorrect early results made it very difficult to complete the question successfully.



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