

Question number	Answer	Notes	Marks
4 (a)	(total) momentum before (a collision) = (total) momentum after (a collision);	<b>ignore unqualified 'momentum is conserved'</b>	1
(b)	correct value of momentum before collision seen anywhere in the calculation; substitution into balanced equation; evaluation of velocity;  e.g. (momentum before =) 1.6 (kgm/s) $1.6 = 0.16 \times 8 + 0.16 \times v$ (v =) 2 (m/s)	either as $0.16 \times 10$ or 1.6	3
(c)	calculation of KE before collision; calculation of KE of either ball after collision; evaluation of energy difference;  e.g. $0.5 \times 0.16 \times 10^2$ $(0.5 \times 0.16 \times 8^2)$ OR $(0.5 \times 0.16 \times 2^2)$ $(8 - (5.12 + 0.32) =) 2.6$ (J)	ecf from (b)  8 (J) 5.12 OR 0.32 (J) allow 2.56 (J)	3

Total for question 4 = 7 marks