

Question Number	Scheme	Marks
2(a)	$For P : \frac{33}{5}mu = 2m(-v_p - -4u)$ $v_p = 0.7u \text{ due E}$	M1 A1 dM1 A1 (4)
(b)	$For Q : \frac{33}{5}mu = 3m(v_Q - -u)$ $v_Q = 1.2u \text{ due E}$	M1 A1 dM1 A1 (4)
Notes		
2(a)	(c)	
2(b)	<p>First M1 for attempt at impulse = difference in momenta, for Q only, (i.e. must be using $3m$ and u). M0 if g's are included on RHS</p> <p>First A1 for either $\frac{33}{5}mu = 3m(v_Q - -u)$ or $\frac{33}{5}mu = 3m(-v_Q - -u)$ oe</p> <p>Second dM1 for answer $\frac{c}{5}u$, where c is an integer, oe</p> <p>Second A1 for $1.2u$ oe due E (or 'reversed' or 'original direction of P)</p> <p>But A0 if just 'changed' or 'to the right' or 'in positive direction'</p>	
2(b) ALT	<p>First M1 for attempt at CLM equation, with correct no. of terms, dimensionally correct, with their v_P substituted.</p> <p>Allow consistent extra g's and cancelled m's and sign errors but masses and velocities must be correctly matched.</p> <p>First A1 for $2m.4u - 3mu = 2m.0.7u + 3m v_Q$ oe or $2m.4u - 3mu = 2m.0.7u - 3m v_Q$ oe</p> <p>Second dM1 for answer $\frac{c}{5}u$, where c is an integer, oe</p> <p>Second A1 for $1.2u$ oe due E</p>	
2(a) ALT	<p>They may find v_Q first, then</p> <p>First M1 for attempt at CLM equation, with correct no. of terms, dimensionally correct, with their v_Q substituted.</p> <p>Allow consistent extra g's and cancelled m's and sign errors but masses and velocities must be correctly matched.</p> <p>First A1 for $2m.4u - 3mu = 2mv_P + 3m \times 1.2u$ oe or $2m.4u - 3mu = -2mv_P + 3m \times 1.2u$ oe</p> <p>Second dM1 for answer $\frac{k}{10}u$, where k is an integer, oe</p> <p>Second A1 for $0.7u$ oe due E (or unchanged)</p>	