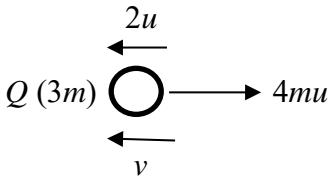


Question Number	Scheme	Marks
1.		
1(a)	$-4mu = 3m(v - 2u)$ or $4mu = 3m(-v + 2u)$ or $-4mu = 3m(-v - 2u)$ or $4mu = 3m(v + 2u)$	M1A1
	speed is $\frac{2}{3}u$ , 0.67u or better	A1
		(3)
1(b)	<p>Same as its original direction or direction is unchanged or just 'unchanged' or 'same direction' or 'it is the same'. Allow 'opposite to P's original direction' or 'towards P'</p> <p>Apply isw if they add 'east' or 'to the left' etc</p> <p>('motion of Q is unchanged' is B0)</p>	DB1
		(1)
		(4)
	<b>Notes for question 1</b>	
1(a)	M1 impulse-momentum equation, dimensionally correct, correct no. of terms, condone sign errors but must be attempting a difference of momenta. Allow if they use $m$ instead of $3m$ .	
	A1 Correct equation ( $v$ may be replaced by $-v$ )	
	A1 cao (must be positive)	
1(b)	DB1 Dependent on obtaining either $\frac{2}{3}u$ or $-\frac{2}{3}u$ for $v$ in (a).	