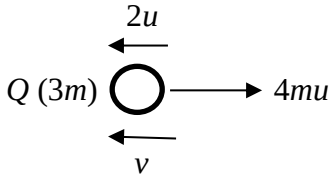
Question Number	Scheme	Marks
1.		
1(a)	$-4mu = 3m(v-2u)$ **or** $4mu = 3m(-v+2u)$ **or** $-4mu = 3m(-v-2u)$ **or** $4mu = 3m(v+2u)$	M1A1
	speed is $\frac{2}{3}u$, $0.67u$ or better	A1
		(3)
1(b)	Same as its original direction or direction is unchanged or just 'unchanged' or 'same direction' or 'it is the same'.Allow 'opposite to *P*'s original direction' or 'towards *P*' Apply isw if they add 'east' or 'to the left' etc ('motion of *Q* is unchanged'is B0)	DB1
		(1)
		(4)
	Notes for question 1	
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 3*m*.	
	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).	