2 Three particles of masses m, $4m$ and km are placed at the points whose coordinates are $(-3, 2)$, $(4, 3)$ and $(6, -4)$ respectively.

The centre of mass of the three particles is at the point with coordinates $(c, 0)$.

Find

(a) the value of k,

(3)

(b) the value of c.

(3)

(Total for Question 2 is 6 marks)

Question Number	Scheme	Marks
2(a)	Moments about x-axis	M1
	$m\times 2+4m\times 3-km\times 4=0$	A1
	$k=3.5$	A1
		(3)
2(b)	Moments about y-axis $\quad m\times -3+4m\times 4+km\times 6=(5+k)m\times c$	M1
	$m\times -3+4m\times 4+3.5m\times 6=8.5m\times c$	A1ft
	$c=4$	A1
		(3)
		(6 marks)
	Notes	
(a) M1	All terms needed and no extras. Must be dimensionally consistent (allow with g in each term or consistent missing m). Condone sign errors.	
A1	Correct unsimplified equation. Allow in vector form.	
A1	oe	
(b) M1	All terms needed and no extras (k does not need to be substituted). Must be dimensionally consistent (allow with g in each term or consistent missing m). Condone sign errors. Award if seen in part (a).	
A1ft	Correct unsimplified equation with their value of k substituted. Award if seen in part (a). Allow in vector form.	
A1	cao	