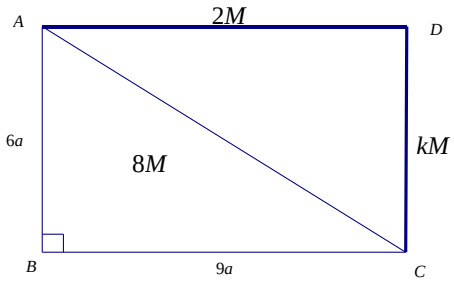
Question Number	Scheme	Marks
7a	 Moments about AB: $(10+k)M\bar{x} = 8M\times 3a + 2M\times\frac{9a}{2} + kM\times 9a$ $(10+k)\bar{x} = 24a + 9a + 9ka = (33+9k)a$ $\bar{x} = \left(\frac{33+9k}{10+k}\right)a$ ***Given Answer***	M1A2 A1 **(4)**
7b	Moments about AD: $(10+k)M\bar{y} = 8M\times 4a + kM\times 3a$ $\bar{y} = \left(\frac{32+3k}{10+k}\right)a$ AC vertical: $\frac{3}{2} = \frac{\bar{x}}{\bar{y}} = \frac{33+9k}{32+3k}$ follow their $\bar{y}$ $(32+3k = 2(11+3k))$ $k = \frac{10}{3}$	M1A2 A1 M1A1ft A1
7balt	Moments about BC: $(10+k)M\bar{y} = 8M\times 2a + kM\times 3a + 2M\times 6a$ $\bar{y} = \left(\frac{28+3k}{10+k}\right)a$ AC vertical: EITHER $\frac{3}{2} = \frac{\bar{x}}{6a-\bar{y}}\left(=\frac{33+9k}{32+3k}\right)$ follow their $\bar{y}$ $(32+3k = 2(11+3k))$ $k = \frac{10}{3}$ OR $\frac{2}{3} = \frac{\bar{y}}{9a-\bar{x}}\left(=\frac{28+3k}{57}\right)$ follow their $\bar{y}$ $(114 = 84+9k)$ $k = \frac{10}{3}$	(M1A2) (A1) (M1A1) (A1) (M1A1) (A1) **(7)** **Total 11**

Notes	
a	
M1	Dimensionally correct moments equation about a *AB* (or parallel). Must have 4 terms. *M* must be included in all terms or none. If numerical distances are clearly included in each term, treat consistent omission of *a* as (a single) accuracy error. Might only be seen in a vector equation.
A1A1	-1 each error. Allow correct equation about any line parallel to *AB*.
A1	Given answer reached convincingly.
b	
M1	Dimensionally correct moments equation about a *AD* (or parallel). Must have 4 terms. *M* must be included in all terms or none. If numerical distances are clearly included in each term, treat consistent omission of *a* as an accuracy error. Might be seen in part (a), but must be used in (b) to score marks.
A1A1	-1 each error. Allow correct equation about any line parallel to *AD*.
A1	Correct $\bar{y}$. Could be from *BC*.
M1	Use their CoM and the fact that *AC* is vertical to form equation in *k* only. Follow through their $\bar{y}$, but must be considering appropriate distances. Condone = 2/3 for M1.
A1ft	Correct equation. Follow through their $\bar{y}$
A1 cao	$k = \frac{10}{3}$ o.e. If no fraction seen, accept 3.33 or better.