

Question			Answer	Mark	AO	Guidance		
7	(a)		DR $\overrightarrow{OP} = \mathbf{a} + \overrightarrow{AP}$ or $\mathbf{c} + \mathbf{a} + \overrightarrow{BP}$ $\overrightarrow{OP} = \mathbf{a} + \frac{1}{3}\mathbf{c}$ $\overrightarrow{OQ} = \frac{3}{4}\overrightarrow{OP} = \frac{3}{4}\left(\mathbf{a} + \frac{1}{3}\mathbf{c}\right)$ $= \frac{3}{4}\mathbf{a} + \frac{1}{4}\mathbf{c}$ AG	M1	3.1a	soi		
			A1	1.1	If labelled then must be correctly identified as $\overrightarrow{OP}$			
			M1	1.1	Use of $\overrightarrow{OQ} = \frac{3}{4}\overrightarrow{OP}$ with their $\overrightarrow{OP}$ soi, may use $\overrightarrow{OQ} = 3\overrightarrow{QP}$			
			A1	1.1	Must see an intermediate step, as a minimum $\frac{3}{4}\left(\mathbf{a} + \frac{1}{3}\mathbf{c}\right)$ oe			
				[4]				
7	(b)		DR $\overrightarrow{AQ} = \frac{3}{4}\mathbf{a} + \frac{1}{4}\mathbf{c} - \mathbf{a} \left[= \frac{1}{4}\mathbf{c} - \frac{1}{4}\mathbf{a}\right]$ $[\overrightarrow{AC} = \mathbf{c} - \mathbf{a}]$ $\Rightarrow \overrightarrow{AQ} = \frac{1}{4}\overrightarrow{AC}$ or $\overrightarrow{AC}$ is a [scalar] multiple of $\overrightarrow{AQ}$ or $\overrightarrow{AQ}$ is parallel to $\overrightarrow{AC}$ or $\overrightarrow{AC} = 4\overrightarrow{AQ}$ Hence Q lies on AC AG	M1	1.1	Or $\overrightarrow{QC} [= -\overrightarrow{OQ} + \overrightarrow{OC}] = -\frac{3}{4}\mathbf{a} - \frac{1}{4}\mathbf{c} + \mathbf{c} \left[= \frac{3}{4}\mathbf{c} - \frac{3}{4}\mathbf{a}\right]$		
			A1	2.1	oe, e.g. $\overrightarrow{QC} = \frac{3}{4}\overrightarrow{AC}$ may see ‘ Q, A, C colinear’ but must be justified.			
			A1	2.2a	Correct conclusion, dep $\overrightarrow{AQ} = \frac{1}{4}\overrightarrow{AC}$ oe seen www Other methods may be seen, e.g. using $\overrightarrow{CQ}$ or $\overrightarrow{QA}$			
			Alternative method $\frac{3}{4}\mathbf{a} + \frac{1}{4}\mathbf{c}$ is of the form $\alpha\mathbf{a} + (1 - \alpha)\mathbf{c}$ Hence Q lies on AC			M2		
			A1					
							[3]	