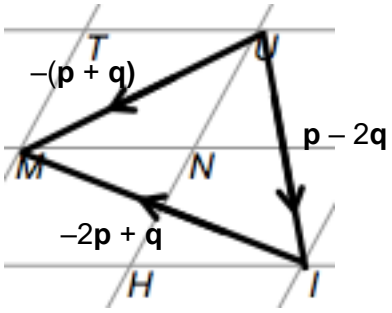
Topic Test 1 Mark Scheme

Vectors - Higher

Q	Answer	Mark	Comments
1	$\begin{pmatrix} 4 \\ -4 \end{pmatrix}$	B1	
2	**a + b + c = 0**	B1	
3(a)	$\overrightarrow{YB}$ or $\overrightarrow{ZC}$ or $\overrightarrow{A'D}$ or $\overrightarrow{B'E}$	B1	Arrows not necessary
3(b)		B2	B1 for any two vectors correct.
4	d = $1\frac{1}{2}$	B1	
	$-4\frac{1}{2}$	B1ft	ft their d
5	$\begin{pmatrix} 6 \\ -3 \end{pmatrix}$	B2	B1 for vector $\begin{pmatrix} 6 \\ a \end{pmatrix}$ or $\begin{pmatrix} b \\ -3 \end{pmatrix}$

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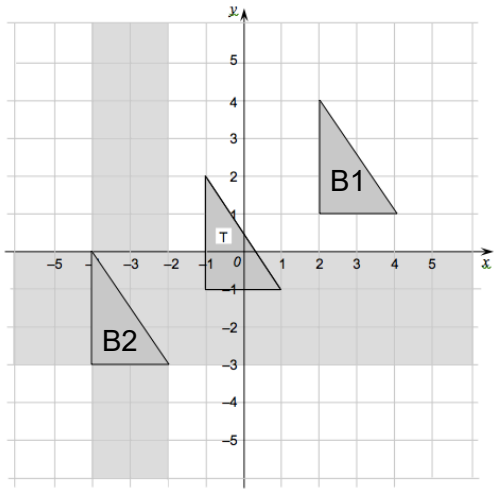
6		B2	B2 for correct translation. B1 for translation of $\begin{pmatrix} 3 \\ 2 \end{pmatrix}$ B1 for translation of $\begin{pmatrix} -3 \\ a \end{pmatrix}$ or translation of $\begin{pmatrix} b \\ -2 \end{pmatrix}$ (ie correct orientation in light grey areas)
7(a)	$\frac{1}{2}\mathbf{c}$	B1	
7(b)	$\frac{1}{2}(\mathbf{b} - \mathbf{c})$	B1	
7(c)	$\frac{1}{2}\mathbf{a} + \frac{1}{2}(\mathbf{b} - \mathbf{a})$	B1	
	$\frac{1}{2}\mathbf{b}$		

Q	Answer	Mark	Comments
8(a)	$\frac{3}{4}(\mathbf{a}+\mathbf{b})$	B1	
8(b)	$-\mathbf{b}$ + their $\frac{3}{4}(\mathbf{a}+\mathbf{b})$	M1	
	$\frac{3}{4}\mathbf{a}-\frac{1}{4}\mathbf{b}$	A1	
8(c)	$\overrightarrow{NC}=\overrightarrow{NM}+\overrightarrow{MC}$ $=\frac{-1}{3}$ their $\overrightarrow{BM}+\frac{1}{4}(\mathbf{a}+\mathbf{b})$	M1	
	$=\frac{-1}{3}\left(\frac{3}{4}\mathbf{a}-\frac{1}{4}\mathbf{b}\right)+\frac{1}{4}(\mathbf{a}+\mathbf{b})$ $=\frac{-1}{4}\mathbf{a}+\frac{1}{12}\mathbf{b}+\frac{1}{4}\mathbf{a}+\frac{1}{4}\mathbf{b}$	A1	oe
	$=\frac{1}{3}\mathbf{b}$ and $\overrightarrow{AC}=\mathbf{b}$ so 3 : 1	A1	

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