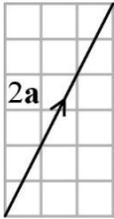This is a non-calculator test (50 minutes).

The following marks are awarded for each question.

B	Unconditional accuracy mark.
M	Method mark – the correct method must be shown but there may be an arithmetic error; the sight of the value given in brackets implies the award of the method mark.
A	Accuracy mark – unless the question specifies that working **must** be shown then the sight of the correct answer implies the award of full marks (unless the answer clearly comes from incorrect working).
C	Communication mark.
P	Process mark to show correct process for problem solving. Any other process of a similar standard to achieve an accurate result is acceptable to achieve this mark.
FT	Incorrect values may be **followed through** from one step to the next **provided** that the correct method is seen in each step and the only errors are arithmetic. This is shown in mark schemes by putting a number in inverted commas.
OE	Or equivalent answer mark.

Q	Answer	Mark	Comment
1a	$\begin{pmatrix} 4 \\ -1 \end{pmatrix}$	B1	
1b	$\begin{pmatrix} -1 \\ -5 \end{pmatrix}$	B1	
3a	$\begin{pmatrix} -1 \\ 10 \end{pmatrix}$	B2	(B1 for −1 or 10 in the correct place.)
3b	$\begin{pmatrix} 2 \\ 18 \end{pmatrix}$	B2	(B1 for 2 or 18 in the correct place.)
3c	$\begin{pmatrix} -1 \\ -14 \end{pmatrix}$	B2	(B1 for −1 or −14 in the correct place.)
5	(2, 1)	B2	(B1 for 2 or 1 in the correct place.)

7a		B1	
7b		B1	

9a	$3\mathbf{a} + 3\mathbf{c}$	B2	(B1 for using 3**c**.)
9b	$\dfrac{2}{3}$ (3**a** + 3**c)** oe	B2	(B1ft for $n($ "3**a** + 3**c**") oe)
9c	$\dfrac{1}{3}\big(6\mathbf{c} - 3\mathbf{a}\big)$ oe	B2	(B1 for use of $n(6\mathbf{c} - 3\mathbf{a})$)
9d	No the direction of the vectors is different so the vectors cannot be the same or No and $\overrightarrow{CT} = \dfrac{2}{3}\,(3\mathbf{a} - 6\mathbf{c})$ and $\overrightarrow{OT} = \dfrac{2}{3}\,(3\mathbf{a} + 3\mathbf{c})$ oe	B1	

11a	$2\mathbf{a} + 4\mathbf{b}$	B2	(B1 for $\overrightarrow{AB} = 4\mathbf{b}$)
11b	$2\mathbf{a} - 2\mathbf{b}$	B2	(B1 for an expression involving $-2\mathbf{b}$)
11c	$\dfrac{1}{3}(2\mathbf{a} - 2\mathbf{b})$	B2	(B1 for $n(2\mathbf{a} - 2\mathbf{b})$)
11d	$3\mathbf{b}$	P1	$\overrightarrow{OE} = 6\mathbf{b} + \dfrac{2}{3}(2\mathbf{a} - 2\mathbf{b})$ $(= \dfrac{14}{3}\mathbf{b} + \dfrac{4}{3}\mathbf{a}$)
		P1	$\overrightarrow{OD} = n\left(\dfrac{14}{3}\mathbf{b} + \dfrac{4}{3}\mathbf{a}\right)$
		P1	$\overrightarrow{OD} = 2\mathbf{a} + k\mathbf{b}$
		A1	Must have working

Question	Topic	Step	Marks
1a	Use 2D Vector notation for translation	7th	1
1b	Use 2D Vector notation for translation	7th	1
3	Add and subtract simple whole number algebraic vectors to find the resultant	8th	6
5	Calculate the resultant of two vectors	10th	2
7	Calculate scalar multiples of column vectors	8th	2
9abc	Apply vector methods for simple geometrical proofs	12th	6
9d	Apply vector methods for simple geometrical proofs	12th	1
11abc	Apply vector methods for simple geometrical proofs	12th	6
11d	Apply vector methods for simple geometrical proofs	12th	4