Question	Answer	Marks	Guidance
10(b)	**Alternative 1**		
	first term = (*their*2)(*their*1.5)^{15} and an attempt at S_{10}	**(M1)**	**FT** *their a* and *r*
	Correct sum $S_{10} = \frac{875.7...(1-1.5^{10})}{1-1.5}$ oe	**(B2)**	**M1 FT** *their* first term and *r* for $S_{10} = \frac{\textit{their}875.7...(1-\textit{their}1.5^{10})}{1-\textit{their}1.5}$
	99 253	**(A1)**	
	Alternative 2		
	Correct sum: $2(1.5)^{15} + 2(1.5)^{16} + 2(1.5)^{17} + 2(1.5)^{18} + 2(1.5)^{19} + 2(1.5)^{20} + 2(1.5)^{21} + 2(1.5)^{22} + 2(1.5)^{23} + 2(1.5)^{24}$ oe or $2(1.5)^{15}\{1 + 1.5 + (1.5)^2 + (1.5)^3 + (1.5)^4 + (1.5)^5 + (1.5)^6 + (1.5)^7 + (1.5)^8 + (1.5)^9\}$	**(M3)**	**M2 FT** *their a* and *r* for sum starting with $2(1.5)^{15}$ **and** ending with $2(1.5)^{24}$ with at most one omission or error or **M1 FT** *their a* and *r* for sum starting with $2(1.5)^{15}$ **or** ending with $2(1.5)^{24}$ with at most two omissions or errors
	99 253	**(A1)**	
11(a)	(–2, 2)	**B2**	**B1** for one correct coordinate nfww **M1** for $\overrightarrow{AC} = \frac{1}{3}\begin{pmatrix} 9 \\ -12 \end{pmatrix}$ or $\overrightarrow{CA} = \frac{1}{3}\begin{pmatrix} -9 \\ 12 \end{pmatrix}$ for $x = -5 + 3$ or $x = 4 - 6$ or for $y = 6 - 4$ or $y = -6 + 8$ or for $x + 5 = \frac{4-x}{2}$ or $6 - y = \frac{y+6}{2}$ or for $2\left(\overrightarrow{OC} - \begin{pmatrix} -5 \\ 6 \end{pmatrix}\right) = \begin{pmatrix} 4 \\ -6 \end{pmatrix} - \overrightarrow{OC}$ oe

Question	Answer	Marks	Guidance
11(b)	$m_{AB} = \frac{-6-6}{4-(-5)}$ oe or $-\frac{12}{9}$ or $-\frac{4}{3}$	**B1**	
	$m_{CD} = \frac{3}{4}$	**M1**	**FT** $\frac{-1}{\textit{their } m_{AB}}$
	$y - 2 = \frac{3}{4}(x+2)$ oe or $y = \frac{3}{4}x + c$ and $2 = \left(\frac{3}{4}\right)(-2)+c$ oe soi	**M1**	**FT** *their* (–2, 2) and $\frac{-1}{\textit{their } m_{AB}}$
	$y = \frac{3}{4}x + \frac{7}{2}$ or equivalent in form $y = mx + c$	**A1**	
11(c)	$(x-4)^2 + (y+6)^2 = 125$ oe, soi	**B1**	
	Uses *their* $y = \frac{3}{4}x + \frac{7}{2}$ to eliminate one unknown	**M1**	if correct implies **B1**
	Correct equation in one unknown $[BD^2 =](x-4)^2 + \left(\frac{3}{4}x + \frac{7}{2} + 6\right)^2 = 125$ oe	**A1**	
	Writes in solvable form: $25x^2 + 100x - 300 = 0$ oe	**A1**	
	Factorises or solves a correct 3-term quadratic	**A1**	
	(2, 5) and (–6, –1)	**A1**	If **B1, M0** award: **SC2** for identifying one correct point by inspection from the length equation and testing it in the correct equation of *CD* **and** **SC2** for identifying the second correct point by inspection from the length equation and testing it in the correct equation of *CD*

Question	Answer	Marks	Guidance
11(c)	**Alternative**		
	$[BC =]$ $\sqrt{(4-(their-2))^2+(-6-(their2))^2}$	**(B1)**	**FT** *their C*
	$CD = \sqrt{125 - their100}$	**(M1)**	**FT** *their* BC^2 providing $125 - their\ 100 > 0$
	$CD = 5$	**(A1)**	
	$\begin{pmatrix}4\\3\end{pmatrix}+\begin{pmatrix}-2\\2\end{pmatrix}$ or $\begin{pmatrix}-4\\-3\end{pmatrix}+\begin{pmatrix}-2\\2\end{pmatrix}$ OR finds $25x^2 + 100x - 300 = 0$ oe	**(A2)**	**A1** for $\overrightarrow{CD_1}=\begin{pmatrix}4\\3\end{pmatrix}$ or $\overrightarrow{CD_2}=\begin{pmatrix}-4\\-3\end{pmatrix}$ soi OR **A1** for finds $(x+2)^2+\left(\frac{3}{4}x+\frac{7}{2}-2\right)^2=25$
	(2, 5) and (–6, –1)	**(A1)**	