Question	Answer	Marks	Guidance
6	$81+108ax+54a^2x^2+12a^3x^3$ soi or $12a^3=\frac{3}{2}$ $b=108a$ $c=54a^2$ soi	**M3**	**M2** for any 3 correct terms or 2 correct equations or **M1** for any 2 correct terms, 1 correct equation or for correct but insufficiently simplified expansion e.g. $3^4+4\times3^3\times ax+\frac{4\times3}{2}\times3^2\times(ax)^2$ $+\frac{4\times3\times2}{3\times2}\times3\times(ax)^3$
	$a=\frac{1}{2}$ oe	**A1**	
	$b = 54$	**A1**	**FT** 108 × *their a*, providing at least **M1** awarded
	$c=\frac{27}{2}$ oe	**A1**	**FT** 54 × (*their a*)^2, providing at least **M1** awarded
7	${}^nC_4=\frac{n!}{(n-4)!4!}$ and ${}^nC_2=\frac{n!}{(n-2)!2!}$ soi	**B1**	
	$\frac{n(n-1)(n-2)(n-3)}{24}=\frac{13n(n-1)}{2}$ or $(n-2)(n-3)=\frac{13\times24}{2}$ oe, soi	**M1**	Writes in a correct form, free of factorials
	$n^2-5n-150$ $[=0]$	**A1**	
	$n = 15$ only, nfww	**A1**	**dep** on previous A1
	${}^{15}C_8=6435$ only	**B1**	
8(a)	(Velocity vector =) $\frac{26}{\sqrt{12^2+5^2}}\begin{pmatrix}12\\5\end{pmatrix}$ oe	**M2**	**M1** for $\sqrt{12^2+5^2}$ or 13 or 2 seen
	(Position vector =) $\begin{pmatrix}3\\-2\end{pmatrix}+t\begin{pmatrix}24\\10\end{pmatrix}$ oe	**A1**	