6	**(a)**		$3^5 + 5\times3^4\times(2x) = 243 + 810x$	**B1**	**1.1**	Obtain $243 + 810x$	Condone $3^5 + 810x$ Allow terms not written as a sum eg written separately, or linked with a comma
			$10\times3^3\times(2x)^2$ or $10\times3^2\times(2x)^3$	**M1**	**1.1a**	Attempt at least one further term – product of correct binomial coeff, power of 3 and attempted power of $2x$, with powers totalling 5	Binomial coeff must be numerical; ${}^5C_2$ is not yet enough Allow BOD if brackets missing when index is applied to $2x$, even if never recovered eg $540x^2$ or $180x^3$
			$+ 1080x^2$	**A1**	**1.1**	Obtain correct third term	Coefficient simplified Terms separate, listed or summed

Question			Answer	Marks	AO	Guidance	
			$+ 720x^3$	A1	1.1	Obtain correct fourth term	Coefficient simplified Could be separate term, part of a list or part of a sum If expanding brackets then mark as above, but all 5 sets of brackets must be considered (allow irrelevant terms to be discarded)
			Alternative method			**Expanding** $\left[3\left(1+\frac{2}{3}x\right)\right]^5$	
			$243 + 810x$ or $243(1+\frac{10}{3}x)$	B1		First two terms correct	Allow with 243 still outside the bracket
			$243(\frac{40}{9}x^2)$ or $243(\frac{80}{27}x^3)$	M1		Attempt one further term	Condone just 3 not 3^5 being used, but must be the correct binomial coeff and an attempt at the correct power of $\frac{2}{3}x$, but allow BOD if no brackets
				A1		Either 3rd or 4th term correct	Allow with 243 still outside the bracket
			$243 + 810x + 1080x^2 + 720x^3$	A1		Fully correct expansion	With the 243 now multiplied into the expansion
				[4]			
6	(b)		$x = y + 2y^2$	B1	3.1a	Identify correct substitution	Could be stated, or implied by use in their binomial expansion
			$1080(y + 2y^2)^2 + 720(y + 2y^2)^3$	M1	1.1a	Attempt to use binomial from **(a)** with their 2 term substitution	Must substitute into at least the x^2 and x^3 terms from their **(a)** Allow **M1** if using $2y + 4y^2$ as their substitution
			$4320y^3 + 720y^3$	M1	1.1a	Attempt expansion to obtain the two relevant terms in y^3	**M0** if any other y^3 terms Expect 4(their 1080) and (their 720) Allow **M1** if using $2y + 4y^2$ as their substitution - expect 16(their 1080) and 8(their 720)

Question			Answer	Marks	AO	Guidance	
			coeff of y^3 is 5040	A1	1.1	Allow $5040y^3$	Ignore any other non-cubic terms
			Alternative method 1			**Attempting binomial expansion of $(3 + (2y + 4y^2))^5$ or $((3 + 2y) + 4y^2)^5$**	
			eg $((3 + 2y) + (4y^2))$	B1		Group into two expressions, and attempt to use them	
			eg $(3 + 2y)^5 + 5(3 + 2y)^4(4y^2)$	M1		Use their groups to obtain the appropriate two elements of their binomial expansion (ie those that would give y^3 terms)	
			eg $(\ldots + 720y^3 + \ldots) + 5(\ldots\ 4.3^3.2y\ldots)(4y^2)$ $= 720y^3 + 4320y^3$	M1		Expand to attempt the two y^3 terms, and no others	
			coeff of y^3 is 5040	A1		Obtain 5040	
			Alternative method 2			**Attempting to expand all 5 brackets**	
			eg $(3 + 2y + 4y^2)^5 =$ $(81 + 216y + 648y^2 + 960y^3\ \ldots\ )(3 + 2y + 4y^2)$	M1		Attempt to use all 5 brackets	An attempt to use all 5 is sufficient
			$(216y \times 4y^2) + (648y^2 \times 2y) + (960y^3 \times 3)$	M1		Attempt all products that would give a y-cubed term	Condone additional terms, even those that would give another y^3 term Irrelevant terms (ie powers greater than 3) may never be seen

Question			Answer	Marks	AO	Guidance	
			$864y^3 + 1296y^3 + 2880y^3$	A1		Obtain correct terms or coefficients, with no more than one incorrect	They must have attempted all of the expected y^3 terms, and no more, with no more than one coefficient error If $(3 + 2y + 4y^2)^4 \times (3 + 2y + 4y^2)$ then expect 2880 + 1296 + 864, If $(3 + 2y + 4y^2)^3 \times (3 + 2y + 4y^2)^2$ then expect 1368 + 1728 + 1512 + 432 If they have not yet combined like terms then this A mark can only be implied by a later correct answer or relevant correct combination of terms
			coeff of y^3 is 5040	A1		Obtain 5040	
				[4]			