

Question	Scheme	Marks	AOs
<b>5(a)</b>	$(2 + 3x)^6 = 2^6 + \binom{6}{1}2^5(3x) + \binom{6}{2}2^4(3x)^2 + \binom{6}{3}2^3(3x)^3 + \dots$	M1	1.1b
	$= 64 + \dots$	B1	1.1b
	$= \dots + 576x + 2160x^2 + 4320x^3 + \dots$	A1 A1	1.1b 1.1b
		<b>(4)</b>	
<b>(a) ALT</b>	$(2 + 3x)^6 =$ $2^6 \left( 1 + \frac{3x}{2} \right)^6 = 2^6 \left( 1 + \binom{6}{1} \left( \frac{3x}{2} \right) + \binom{6}{2} \left( \frac{3x}{2} \right)^2 + \binom{6}{3} \left( \frac{3x}{2} \right)^3 + \dots \right)$	M1	1.1b
	$= 64 + \dots$	B1	1.1b
	$= \dots + 576x + 2160x^2 + 4320x^3 + \dots$	A1 A1	1.1b 1.1b
		<b>(4)</b>	
<b>(b)</b>	$3 \times "64" \quad \text{or} \quad \pm \frac{1}{8} \times "4320"$	M1	1.1b
	Coefficient of $x$ is: $3 \times "64" - \frac{1}{8} \times "4320"$	M1	3.1a
	$= -348$	A1	1.1b
		<b>(3)</b>	

**(7 marks)**

### Notes

**(a)**

M1: For the correct structure of one of terms 2, 3 or 4. This requires a correct binomial coefficient combined with a correct power of 2 and a correct power of (3x) condoning missing brackets around the '3x'

B1: For 64

A1: For 2 of  $+576x + 2160x^2 + 4320x^3 + \dots$  (Allow terms to be listed)

A1: All 3 of  $+576x + 2160x^2 + 4320x^3 + \dots$  (Allow terms to be listed)

**(a) ALT**

M1: Takes out a factor of  $2^6$  together with a correct structure for one of terms 2, 3 or 4 in the bracket. This requires a correct binomial coefficient combined a correct power of  $\frac{3x}{2}$

B1: For 64

A1: For 2 of  $+576x + 2160x^2 + 4320x^3 + \dots$  (Allow terms to be listed)

A1: All 3 of  $+576x + 2160x^2 + 4320x^3 + \dots$  (Allow terms to be listed)

**(b)**

M1: For attempting one correct "term". Condone sign error on 2<sup>nd</sup> term.

M1: Fully correct strategy for the required coefficient using their expansion from part (a)

A1: For -348