Question	Scheme	Marks	AOs
8(a)	$(2+3x)^6$		
	$64+\ldots$	B1	1.1b
	$\ldots+\binom{6}{1}2^5.(3x)+\binom{6}{2}2^4.(3x)^2+\binom{6}{3}2^3.(3x)^3+\ldots$	M1	1.1b
	Two of $\ldots+576x+2160x^2+4320x^3+\ldots$	A1	1.1b
	$64+576x+2160x^2+4320x^3+\ldots$	A1	1.1b
		(4)	
(b)	$(2-3x)^6$		
	$64-576x+2160x^2-4320x^3+\ldots$	B1ft	2.2a
		(1)	
(c)	$\left[(2+3x)^6+(2-3x)^6\right]^2$		
	$(64+576x+2160x^2(+4320x^3)+\ldots)+(64-576x+2160x^2(-4320x^3)+\ldots)$ $=128+4320x^2+\ldots$	M1	2.2a
	$(128+4320x^2+\ldots)^2=16384+1105920x^2$	A1	1.1b
		(2)	
(d)	$\left[(2+ax)^n+(2-ax)^n\right]^p$		
	$(2^n+2^n)^p$	M1	2.1
	$=(2\times2^n)^p=2^{p(n+1)}$	A1	1.1b
		(2)	
			(9 marks)

Notes:

(a)

B1: For 64

M1: Attempts the binomial expansion. May be awarded on either term two and/or term three.

Scored for a correct binomial coefficient combined with a correct power of 2 and a correct power of $(3x)$

A1: For two out of three simplified terms correct from $\ldots+576x+2160x^2+4320x^3+\ldots$

A1: For all remaining terms correct $\ldots+576x+2160x^2+4320x^3+\ldots$ ignore any extra terms.

Listing is acceptable for all 4 marks.

(b)

B1ft: Deduces that the signs of the second and fourth terms should be negative.

Follow through on their terms $"64"-"576"x+"2160"x^2-"4320"x^3+\ldots$

(c)

M1: Deduces that the second terms will cancel and adds their two answers to arrive at an expression of the form $2\times"64"+2\times"2160"x^2+...$ Dependent on part (b).

A1: $16384+1105920x^2+...$

(d)

M1: For the key step in realising that the term independent of x will be $\left(2^n+2^n\right)^p$ or $(2\times 2^n)^p$

A1: $2^{p(n+1)}$ or 2^{np+p} o.e.