Question	Scheme	Marks	AOs
8(a)	2^6 or 64 as the constant term	B1	1.1b
	$\left(2+\dfrac{3x}{4}\right)^6 = ...+ {}^6C_1 2^5\left(\dfrac{3x}{4}\right)^1 + {}^6C_2 2^4\left(\dfrac{3x}{4}\right)^2 + ...$	M1	1.1b
	$= ...+ 6\times 2^5\left(\dfrac{3x}{4}\right)^1 + \dfrac{6\times 5}{2}\times 2^4\left(\dfrac{3x}{4}\right)^2 + ...$	A1	1.1b
	$= 64 + 144x + 135x^2 + ...$	A1	1.1b
		(4)	
(b)	$\dfrac{3x}{4} = -0.075 \Rightarrow x = -0.1$ So find the value of $64 + 144x + 135x^2$ with $x = -0.1$	B1ft	2.4
		(1)	
			(5 marks)

Notes

(a)

B1: Sight of either 2^6 or 64 as the constant term

M1: An attempt at the binomial expansion. This may be awarded for a correct attempt at either the second **OR** third term. Score for the correct binomial coefficient with the correct power of 2 and the correct power of $\dfrac{3x}{4}$ condoning slips. Correct bracketing is not essential for this M mark.

Condone ${}^6C_2 2^4 \dfrac{3x}{4}^2$ for this mark

A1: Correct (unsimplified) second **AND** third terms.

The binomial coefficients must be processed to numbers /numerical expression e.g $\dfrac{6!}{4!2!}$ or $\dfrac{6\times 5}{2}$

They cannot be left in the form ${}^6C_1$ and/or $\begin{pmatrix} 6 \\ 2 \end{pmatrix}$

A1: $64 + 144x + 135x^2 + ...$ Ignore any terms after this. Allow to be written $64, 144x, 135x^2$

(b)

B1ft: $x = -0.1$ or $-\dfrac{1}{10}$ **with** a comment about substituting this into their $64 + 144x + 135x^2$

If they have written (a) as $64, 144x, 135x^2$ candidate would need to say substitute $x = -0.1$ into the sum of the first three terms.

As they do not have to perform the calculation allow

Set $2 + \dfrac{3x}{4} = 1.925$, solve for x and then substitute this value into the expression from (a)

If a value of x is found then it must be correct

Alternative to part (a)

$$\left(2+\dfrac{3x}{4}\right)^6 = 2^6\left(1+\dfrac{3x}{8}\right)^6 = 2^6\left(1+ {}^6C_1\left(\dfrac{3x}{8}\right)^1 + {}^6C_2\left(\dfrac{3x}{8}\right)^2 + ...\right)$$

B1: Sight of either 2^6 or 64

M1: An attempt at the binomial expansion. This may be awarded for either the second or third term. Score for the correct binomial coefficient with the correct power of $\dfrac{3x}{8}$ Correct bracketing is not essential for this mark.

A1: A correct attempt at the binomial expansion on the second and third terms.

A1: $64 + 144x + 135x^2 + ...$ Ignore any terms after this.