Question number	Scheme	Marks
5 (a)	$4e^{4x}(6x+2)^{\frac{3}{2}}+\frac{3}{2}.6.e^{4x}(6x+2)^{\frac{1}{2}}=\left[4e^{4x}(6x+2)^{\frac{3}{2}}+9e^{4x}(6x+2)^{\frac{1}{2}}\right]$	M1 A1 A1
	$e^{4x}\sqrt{6x+2}(24x+17)$	dM1 A1 [5]
(b)	$\dfrac{3\cos 3x(2x-4)^3-\sin 3x.2.3.(2x-4)^2}{\left[(2x-4)^3\right]^2}=\left[\dfrac{3\cos 3x(2x-4)^3-6\sin 3x(2x-4)^2}{(2x-4)^6}\right]$ OR $\dfrac{3\cos 3x(2x-4)^3-\left(24x^2-96x+96\right)\sin 3x}{(2x-4)^6}$	M1 A1 A1
	ALT using product rule $\sin 3x(2x-4)^{-3}$ $3\cos 3x(2x-4)^{-3}+\sin 3x(-3)(2)(2x-4)^{-4}=\left[3\cos 3x(2x-4)^{-3}-6\sin 3x(2x-4)^{-4}\right]$	M1 A1 A1 [3]
	Total	**8 marks**

Part	Mark	Additional Guidance
(a)	M1	Use of product rule to give an expression of the form $pe^{4x}(6x+2)^{\frac{3}{2}}+qe^{4x}(6x+2)^{\frac{1}{2}}$ where $p = 1$ or 4, $q > 1$. There must be a + sign between terms.
	A1	Either term correct. Note that simplification is not required for this mark.
	A1	Both terms correct. Note that simplification is not required for this mark.
	dM1	Obtains an expression of the form $e^{4x}\left(\sqrt{6x+2}\right)(Ax+B)$ where $A, B \neq 0$ You **must** check their working here that it follows from their attempt at product rule. There must be an intermediate step seen as follows for example: $4e^{4x}(6x+2)^{\frac{3}{2}}+9e^{4x}(6x+2)^{\frac{1}{2}}=e^{4x}(6x+2)^{\frac{1}{2}}\left(4\left(6x+2\right)+9\right)$ **Note: This mark is dependent on the first M Mark**
	A1	Correct $A = 24$ and correct $B = 17$
(b)	M1	Attempt at the quotient rule. Numerator must be the **difference** of two terms (either way round) of the form $k\cos 3x(2x-4)^3 - l\sin 3x(2x-4)^2$, $k=\pm 3$ $l \geqslant 3$ OR accept: (terms wrong way around) $l\sin 3x(2x-4)^2 - k\cos 3x(2x-4)^3$, $k=\pm 3$ $l \geqslant 3$ Denominator must be of the form $(2x-4)^6$ or accept $\left[(2x-4)^3\right]^2$
	A1	Either term correct, either way round.
	A1	Fully correct
	ALT	
	M1	Use of product rule to give an expression of the form $k\cos 3x(2x-4)^{-3} - l\sin 3x(2x-4)^{-4}$, $k=\pm 3$ $l \geqslant 3$ Accept for this mark $l\sin 3x(2x-4)^{-4} - k\cos 3x(2x-4)^{-3}$
	A1	Either term correct.
	A1	Fully correct
	NB: Ignore any subsequent simplification of their derivative.	