Question Number	Scheme	Marks
3(a)	$\left(1+3x^2\right)^{-\frac{1}{4}} = 1+\left(-\frac{1}{4}\right)\left(3x^2\right)+\frac{\left(-\frac{1}{4}\right)\left(-\frac{5}{4}\right)}{2(!)}\left(3x^2\right)^2+\frac{\left(-\frac{1}{4}\right)\left(-\frac{5}{4}\right)\left(-\frac{9}{4}\right)}{3!}\left(3x^2\right)^3$	M1
	$=1-\frac{3}{4}x^2+\frac{45}{32}x^4-\frac{405}{128}x^6$	A2,1,0 (3)
(b)	$x^2<\frac{1}{3} \Rightarrow \lvert x\rvert<\frac{1}{\sqrt{3}}$	B1 (1)
(c)	$\mathrm{f}(x)=\left(3+kx^2\right)\left(1-\frac{3}{4}x^2+\frac{45}{32}x^4-\frac{405}{128}x^6\right)$	M1
	$=3+\left(k-\frac{9}{4}\right)x^2+\left(\frac{135}{32}-\frac{3k}{4}\right)x^4+\left(\frac{45k}{32}-\frac{1215}{128}\right)x^6$	M1A1 (3)
(d)	$\frac{135}{32}=\frac{3k}{4}, \qquad k=\frac{135}{32}\times\frac{4}{3}=\frac{45}{8}$	M1,A1 (2)
		[9]
4. **(a)**	$3\sin 5x+15x\cos 5x$	M1A1A1 (3)
(b)	$\frac{2\mathrm{e}^{2x}\left(4-3x^2\right)-\mathrm{e}^{2x}(-6x)}{\left(4-3x^2\right)^2}$	M1A1A1 (3)
		[6]