Question	Answer	Marks	Partial Marks
12(a)	$15(1-\sin^2(3x+1.5))+7\sin(3x+1.5)-13\,[=0]$	**M1**	
	$15\sin^2(3x+1.5)-7\sin(3x+1.5)-2\,[=0]$	**A1**	
	$(5\sin(3x+1.5)+1)(3\sin(3x+1.5)-2)\,[=0]$	**M1**	Factorises or solves *their* 3-term quadratic in $\sin(3x + 1.5)$ **dep** on previous **M1**
	$3x + 1.5 = -0.201[3\ldots]$ or $3x + 1.5 = 0.729[7\ldots]$ or $3x + 1.5 = 2.41[1\ldots]$ or $3x+1.5=\sin^{-1}\left(their-\frac{1}{5}\right)$ or $3x+1.5=\sin^{-1}\left(their\frac{2}{3}\right)$	**M1**	**dep** on previous **M1** **FT** providing $-1 \leqslant their\ -\frac{1}{5} \leqslant 1$ and/or $-1 \leqslant their\ \frac{2}{3} \leqslant 1$
	$x = 0.304$ or $0.3039[54\ldots]$ and $x = -0.257$ or $-0.2567[57\ldots]$ and no extras	**A1**	

Question	Answer	Marks	Partial Marks
12(b)	$30(\cos(3x+1.5))(-3\sin(3x+1.5))$ $+21\cos(3x+1.5)$ $[=0]$	**M2**	**M1** for correctly differentiating $\cos(3x + 1.5)$ or $\sin(3x + 1.5)$
	$(3\cos(3x+1.5))\big(7-30\sin(3x+1.5)\big)[=0]$ oe	**M1**	**FT** a derivative of the form $a\cos(3x+1.5)\sin(3x+1.5)+b\cos(3x+1.5)[=0]$ where $a < 0$ and $b > 0$
	$3x + 1.5 = \frac{\pi}{2}$ or 1.57[0…] or $\cos^{-1}(0)$ or $3x + 1.5 = 0.235[5\ldots]$ or $3x+1.5=\sin^{-1}\left(\frac{\textit{their } 7}{\textit{their } 30}\right)$	**M1**	**dep** on previous **M1** **FT** (*their* 3)$\cos(3x + 1.5)$ × $\{(\textit{their } 7)-(\textit{their } 30)\sin(3x+1.5)\}$ providing *their* 3 ≠ 0 and *their* 30 > *their* 7
	x = 0.0236 or 0.02359[87…] and x = 0.469 or 0.4686[96…] and no extras	**A1**	**dep** on all previous marks awarded
13	$4\times8^{2x}+8^{x}-3[=0]$ or $4\times(2^{3x})^{2}+2^{3x}-3[=0]$ oe	**B1**	
	$\left(4(8^{x})-3\right)\left(8^{x}+1\right)$ or $\left(4(2^{3x})-3\right)\left(2^{3x}+1\right)$ oe	**M1**	**FT** *their* 3-term quadratic in 8^x or 2^{3x}
	$8^{x}=\frac{3}{4}$ or $2^{3x}=\frac{3}{4}$ oe, nfww	**A1**	
	$x=\log_{8}(0.75)$ or $\frac{1}{3}\log_{2}(0.75)$ or –0.138[34…] oe	**A1**	and no other solutions

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