Question	Answer	Marks	Partial Marks
4(b)(i)	$1+4(2\sqrt{2})+6(2\sqrt{2})^2+4(2\sqrt{2})^3+(2\sqrt{2})^4$ soi or $1+4(-2\sqrt{2})+6(-2\sqrt{2})^2+4(-2\sqrt{2})^3$ $+(-2\sqrt{2})^4$ soi	**M1**	
	$1+8\sqrt{2}+48+64\sqrt{2}+64$ or $1-8\sqrt{2}+48-64\sqrt{2}+64$	**A1**	
	Correct difference stated or clearly implied $1+8\sqrt{2}+48+64\sqrt{2}+64-$ $(1-8\sqrt{2}+48-64\sqrt{2}+64)$	**M1**	**dep** on sight of correct expansions with numerical coefficients
	$144\sqrt{2}$ nfww	**A1**	
4(b)(ii)	$\frac{(their\ k)\sqrt{2}}{1+\sqrt{2}}\times\frac{1-\sqrt{2}}{1-\sqrt{2}}=$ $\frac{(their\ k)\sqrt{2}-2their\ k}{-1}$ oe simplified to $2(their\ k)-(their\ k)\sqrt{2}$ mark final answer	**2**	**STRICT FT** of *their* integer value of k **B1 STRICT FT** of *their* integer value of k for $\frac{their\ k\sqrt{2}}{1+\sqrt{2}}\times\frac{1-\sqrt{2}}{1-\sqrt{2}}$
5(a)(i)	$\sec^2 x+2\tan^2 x$ oe and correct completion to $3\tan^2 x+1$ nfww	**2**	**M1** for use of a relationship to form a convincing correct statement from which the answer can be easily determined e.g. $\sec^2 x+\frac{2\sin^2 x}{\cos^2 x}$ or $\frac{1}{\cos^2 x}+2\tan^2 x$
5(a)(ii)	$\tan x=[\pm]1$ soi	**M1**	**FT** $\tan x=[\pm]\sqrt{\frac{4-their1}{their3}}$ providing $\frac{4-their1}{their3}>0$
	$[x=]\frac{\pi}{4},-\frac{\pi}{4}$ or $\pm0.785[39\ldots]$ nfww and no other solutions	**A2**	**A1** for each, ignoring extra solutions

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Question	Answer	Marks	Partial Marks
5(a)(iii)	$f'(x) = 6\tan x \sec^2 x$ oe	**M2**	**FT** $2(their 3)\tan x \sec^2 x$ **M1** for $f'(x) = k\tan x \sec^2 x$ where $k \neq 2 their\ 3$
	$\left[f'\left(\frac{\pi}{4}\right)=\right]$ 12; $\left[f'\left(-\frac{\pi}{4}\right)=\right]$ – 12 nfww	**A2**	**A1** for each nfww
5(b)	Correct use of $\sin^2\theta + \cos^2\theta = 1$ to form a 3-term quadratic in $\sin\theta$ in solvable form $50\sin^2\theta + 5\sin\theta - 3\,[=0]$ oe	**M1**	Condone one sign or arithmetic error in rearrangement
	Solves or factorises *their* 3-term quadratic in $\sin\theta$ e.g. $(10\sin\theta + 3)(5\sin\theta - 1)$ [= 0]	**M1**	**FT** *their* 3-term quadratic in $\sin\theta$
	$\sin\theta = -0.3$ $\sin\theta = 0.2$ soi	**A1**	
	11.5 or 11.53[69...] 168.5 or 168.46[30...] 197.5 or 197.45[76...] 342.5 or 342.54[23...]	**A2**	with no extras in range **A1** for any two correct angles, ignoring extras
6(a)	$(2x + 1)(x - 3)(x + 1)$ nfww	**M1**	
	Correct method leading to $x = -\frac{1}{2}$, $x = 3$, $x = -1$	**A1**	
6(b)(i)	$[p'(x) =]\ 3x^2 + 2ax + b\,[=0]$	**B1**	
	$3\left(\frac{4}{3}\right)^2 + 2a\left(\frac{4}{3}\right) + b = 0$	**B1**	OR forms the product $(3x - 4)(x - 2) = 0$
	$3(2)^2 + 2a(2) + b = 0$	**B1**	OR multiplies out to find $3x^2 - 10x + 8 = 0$
	Solves to find the value of one unknown	**M1**	**FT** *their* linear equations in a and b oe OR compares coefficients to state a value of a or b
	$a = -5$, $b = 8$	**A1**	
	[p(1)=] $1 + a + b + c = -5$ oe, soi	**M1**	
	$[1 - 5 + 8 + c = -5]$ $c = -9$	**A1**	

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