Question	Answer	Marks	Guidance
3	$\lg\left((2x-1)(x+2)\right)=\lg\frac{100}{4}$ oe or $10^2=4(2x-1)(x+2)$ oe	**M2**	**M1** for one log law correctly applied within a correct equation e.g. $\lg 4(2x-1)(x+2) \quad =2$
	$2x^2+3x-27[=0]$	**A1**	Collects terms to correct 3-term quadratic in solvable form
	$(2x+9)(x-3)[=0]$	**M1**	**dep** on at least **M1** previously awarded Factorises *their* $2x^2+3x-27$ or solves *their* $2x^2+3x-27=0$
	$x = 3$ indicated as only valid solution	**A1**	nfww
4(a)	$2k+6=8-16+6k+2$ oe	**M1**	For equating line to curve and substituting $x = 2$, or vice versa
	$k = 3$	**A1**	
4(b)	$x^3-4x^2+(2\times \textit{their}\, k)x-4 \quad [=0]$ or $x^3-4x^2+6x-4 \quad [=0]$	**M1**	**FT** *their k* in correct cubic
	x^2-2x+2	**A2**	Correct quadratic factor from correct cubic **A1** for a quadratic factor with two terms correct, from correct cubic
	$(-2)^2-4(1)(2) < 0$ oe or $4 - 8 < 0$ oe [and so $x = 2$ is the only solution]	**A1**	Uses discriminant correctly on the correct quadratic factor

Question	Answer	Marks	Guidance
5(a)	$\frac{\cos^2 x+(1-\sin x)^2}{(1-\sin x)\cos x}$ or $\frac{\cos^2 x}{(1-\sin x)\cos x}+\frac{(1-\sin x)^2}{(1-\sin x)\cos x}$	**M1**	Correctly takes common denominator
	$\frac{\cos^2 x+1-2\sin x+\sin^2 x}{(1-\sin x)\cos x}$	**A1**	OR $\frac{1-\sin^2 x+(1-\sin x)^2}{(1-\sin x)\cos x}$
	$\frac{1+1-2\sin x}{(1-\sin x)\cos x}$ or $\frac{1-\sin^2 x+1-2\sin x+\sin^2 x}{(1-\sin x)\cos x}$	**A1**	OR $\frac{(1-\sin x)(1+\sin x)+(1-\sin x)^2}{(1-\sin x)\cos x}$
	$\frac{2(1-\sin x)}{(1-\sin x)\cos x}=2\sec x$ or $\frac{2-2\sin x}{(1-\sin x)\cos x}=\frac{2}{\cos x}=2\sec x$ or equivalent	**A1**	All steps correct and final step justified OR $\frac{1+\sin x+1-\sin x}{\cos x}=2\sec x$
	Alternative ***Must work with LHS only***		
	$\frac{(\cos x)(1+\sin x)}{(1-\sin x)(1+\sin x)}+\frac{(1-\sin x)\cos x}{(\cos x)\cos x}$	**(M1)**	Forms fractions with common denominator in different form
	$\frac{(\cos x)(1+\sin x)}{\cos^2 x}+\frac{(1-\sin x)\cos x}{\cos^2 x}$	**(A1)**	Uses difference of two squares and $\sin^2 x+\cos^2 x=1$ to write fractions with a common denominator in the same form
	$\frac{2\cos x}{\cos^2 x}$	**(A1)**	Combine as a single fraction and collects terms
	$\frac{2}{\cos x}=2\sec x$	**(A1)**	All steps correct and final step justified
5(b)	$\cos^3\frac{\theta}{2}=\frac{1}{4}$	**B1**	
	$\cos\frac{\theta}{2}=\sqrt[3]{their\ \frac{1}{4}}$ soi	**M1**	**dep** on starting with $2\sec\frac{\theta}{2}=8\cos^2\frac{\theta}{2}$
	±101.9 awrt	**A2**	and no extras in range **A1** for either, ignoring extras in range If **A0** then **SC1** for ±102 with no extras in range